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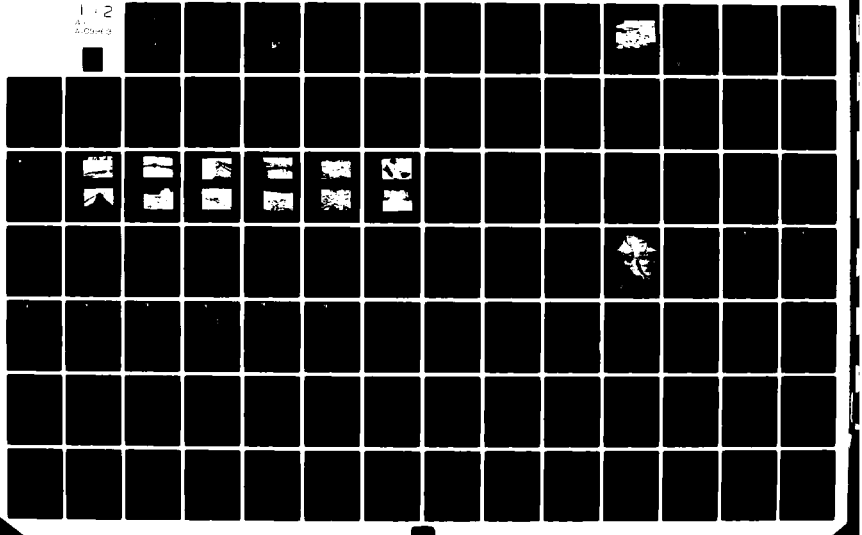

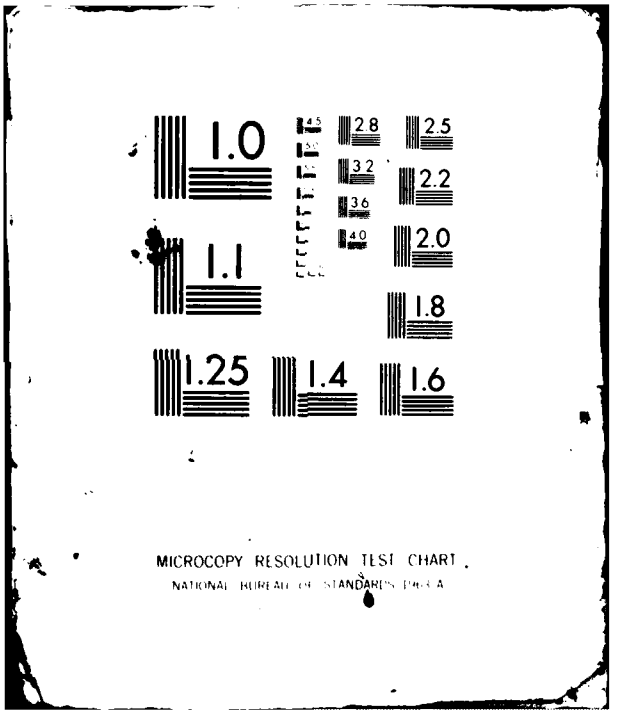
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Visual Inspection
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Lake Muskoday Dam
Sullivan County, N.Y.
Delaware River Basin

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)
This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies that need to be evaluated and remedied.

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Using the Corps of Engineers' screening criteria for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped by all storms exceeding 11 percent of the Probable Maximum Flood (PMF). Dam overtopping, the resulting erosion of the embankment and hence, dam breaching would cause water surface levels downstream to reach depths which would pose significant danger to residents. Therefore, the spillway is adjudged to be seriously inadequate and the dam is assessed as unsafe, nonemergency.

The classification "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to life downstream of the dam.

DELAWARE RIVER BASIN

LAKE MUSKODAY DAM

SULLIVAN COUNTY, NEW YORK
INVENTORY No. NY 341

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NEW YORK DISTRICT, CORPS OF ENGINEERS
JULY 1981

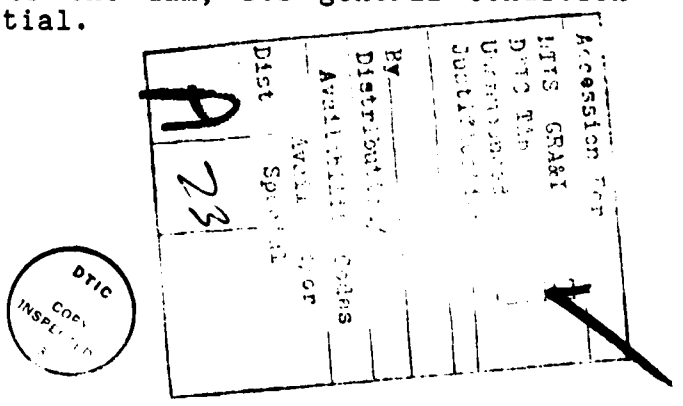
PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.



PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
LAKE MUSKODAY DAM
INVENTORY NO. NY 341
DELAWARE RIVER BASIN
SULLIVAN COUNTY, NEW YORK

TABLE OF CONTENTS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Lake Muskoday Dam

State Located: New York

County: Sullivan

Watershed: Delaware River Basin

Watercourse: Trout Brook

Date of Inspection: April 8, 1981

ASSESSMENT

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies that need to be evaluated and remedied.

Using the Corps of Engineers' screening criteria for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped by all storms exceeding 11 percent of the Probable Maximum Flood (PMF). Dam overtopping, the resulting erosion of the embankment and hence, dam breaching would cause water surface levels downstream to reach depths which would pose significant danger to residents. Therefore, the spillway is adjudged to be seriously inadequate and the dam is assessed as unsafe, nonemergency.

The classification "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to life downstream of the dam.

It is recommended that the following additional investigations be performed by a registered professional engineer engaged by the owner:

1. Conduct a detailed hydrologic and hydraulic analysis to more accurately determine the site specific chararacteristics of the watershed.

2. Investigate the water flow that was evident in the downstream rockfill on either side of the spillway, including observation when lake levels vary, and determine the source of the flow, evaluate the potential for dam instability or failure and recommend remedial measures, if appropriate.

It is recommended that within 3 months of the final approval date of this report, both additional investigations should be initiated and within 18 months, appropriate remedial measures should be completed. In the interim, a plan for providing around-the-clock surveillance of the dam during periods of unusually heavy precipitation should be developed and implemented.

The following remedial measures should be completed within 12 months to correct existing deficiencies:

1. Clear brush, trees and debris from the downstream rockfill, and recut at least annually to maintain the cleared condition.

2. Fill and regrade the local potholes on the dam crest, and grade the roadway and its side ditches to avoid detrimental erosion at the dam.

3. Place rockfill or riprap erosion protection where the upstream earthen embankment has been eroded by wave action.

4. Develop and implement a flood warning and emergency evacuation plan to alert downstream residents in the event conditions occur which could result in failure of the dam.

5. A program for regular maintenance should be developed and implemented.

Submitted by: FLAHERTY GIAVARA ASSOCIATES, P.C.

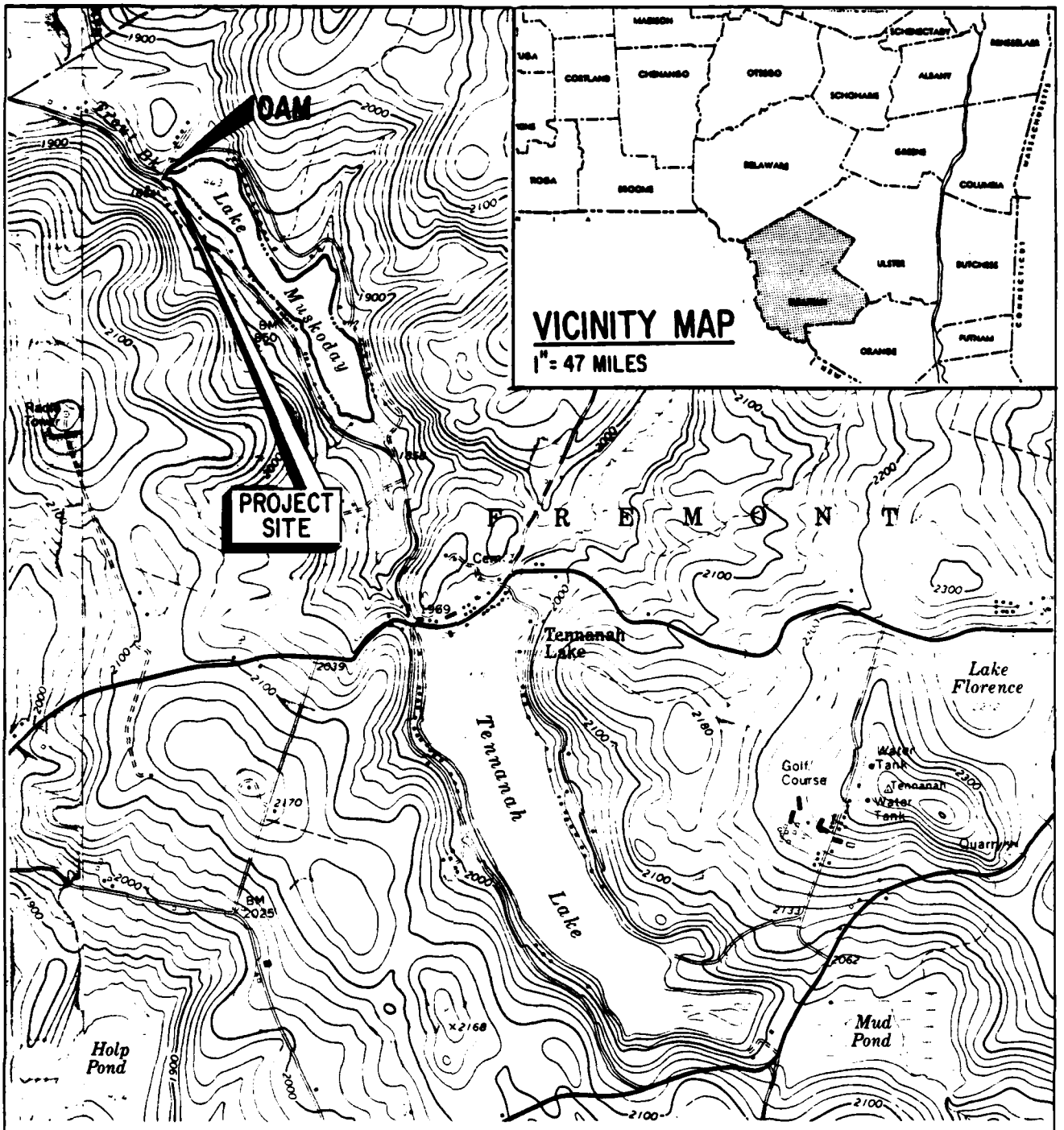
Hugh C. Flaherty, P.E. & L.S.
Chairman of the Board
New York License No. 58508

Approved by:

Col. W. M. Smith, Jr.
New York District Engineer

Date: 14 Sep 81

PHOTO #1: Overview of
Lake Muskoday Dam
Inventory No. NY 341



LOCATION MAP

LAKE MUSKODAY DAM
INVENTORY No. NY 341
DELAWARE RIVER BASIN
SULLIVAN COUNTY
FREMONT, NEW YORK

FLAHERTY · GIAVARA ASSOCIATES, P.C.

NATIONAL DAM SAFETY PROGRAM
PHASE I INSPECTION REPORT
LAKE MUSKODAY DAM
INVENTORY NO. NY 341
D.E.C. NO. 147A-413
DELAWARE RIVER BASIN
SULLIVAN COUNTY, NEW YORK

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I Inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367. Flaherty Giavara Associates, P.C. has been retained by the New York District to inspect and report on selected dams in the State of New York. Authorization and notice to proceed was issued to Flaherty Giavara Associates, P.C. under a letter of December 24, 1980 from W. M. Smith Jr., Colonel, Corps of Engineers. Contract No. DACW 51-81-C-0006 has been assigned by the Corps of Engineers for this work.

b. Purpose

Evaluation of the existing conditions of the subject dam to identify deficiencies and hazardous conditions, determine if they constitute hazards to life and property and recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

Lake Muskoday Dam consists of a stone masonry and stone fill structure with an upstream concrete wall and a concrete overflow spillway in the central portion. The 20 foot wide crest of the dam and a timber deck over the spillway carry a private access road to lakefront property. The total length of the dam is approximately 155 feet, including the 17.4 wide spillway section. A sketch plan and sections prepared by Sheldon Hadden, P.E. are shown on page D-9 in Appendix D.

The dam structure is approximately 17 feet high; it has an irregular upstream earthen slope below the projecting concrete wall and irregular downstream rockfill that has a slope in the range from 2 to 3 horizontal to 1 vertical. An old inspection report indicates that the up-

stream concrete wall extends 3 to 6 feet below the original ground surface to "hard pan" to form a cutoff.

The overflow spillway is 17.4 feet wide and is located in the center of the embankment. It has concrete abutments and wingwalls with a rockfill apron and a timber and steel bridge spans its width.

b. Location

Lake Muskoday Dam is located approximately 4.3 miles southwest of the village of Roscoe in the Town of Fremont, New York. The dam is located at latitude north 41°-54.8' and longitude west 74°-59.7' on the U.S. Geological Survey 7.5 minute series topographic map "Roscoe, New York". The Location Map on page i indicates where the dam is situated.

c. Size Classification

The maximum height of the dam is 17 feet and the maximum storage capacity is 370 acre-feet at the top of dam. Therefore, Lake Muskoday Dam is classified as a "Small" dam as defined by the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

There are three roads and approximately 4 dwellings within the dam failure flood hazard area. Therefore, the dam is in the "High" hazard category as defined by the Recommended Guidelines for Safety Inspection of Dams.

e. Ownership

The dam is owned by the Lake Muskoday Bungalow Colony, Inc. The address is as follows:

Owner

Contact: Ms. Dorothy B. Graham, Secretary
Lake Muskoday Bungalow Colony, Inc.
Lake Muskoday
Roscoe, New York 12776

f. Purpose

The primary purpose of this dam is to maintain the water level of the lake for recreational use.

g. Design and Construction History

The dam was constructed in 1925. Some design data is documented in the application for the construction of the dam dated January 22, 1924 which is included in Appendix D. No other design or construction history data was obtained.

The only major post construction modification noted was the addition of riprap and stone masonry to the dam in 1975 and 1976.

h. Normal Operating Procedure

There are no regular operating procedures for this dam. The normal water level in the lake is maintained by the crest elevation of the spillway weir at 1843.0 (NGVD).

1.3 PERTINENT DATA

a. Drainage Area (Square Miles)	4.45
b. Discharge at Dam Site (CFS)	
- Top of Dam	189
- Crest of Overflow Spillway	-
c. Elevations (NGVD - estimated)	
- Top of Dam	1845.6
- Crest of Overflow Spillway	1843.0
- Reservoir Drain (outlet invert)	1839.3±
d. Reservoir Surface Area (Acres)	
- Top of Dam	57
- Crest of Overflow Spillway	50
e. Storage (Acre-Feet)	
- Top of Dam	370
- Crest of Overflow Spillway	240
f. Dam	
- Type: Stone fill between stone masonry and concrete walls and a concrete cutoff with a rockfill downstream slope	
- Length (Feet)	155
- Upstream Slope (H:V)	varies
- Downstream Slope (H:V)	2.0-3.0:1
- Crest Width (Feet)	20

g. Overflow Spillway

- Type: Concrete weir with concrete abutments and a rockfill apron	
- Length (Feet)	17.4
- Width (Feet)	20
- Side Slopes (H:V)	vertical
- Channel Bottom Slopes (Feet/Foot)	-

- Control: None

h. Reservoir Drain

- Type: 24 inch diameter corrugated metal pipe (25 feet long)

- Control: "Stopboards"

SECTION 2 - ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Lake Muskoday Dam is located on Trout Brook, a northwesterly flowing tributary to the Beaver Kill, about 4.3 miles southwest of the village of Roscoe, a short distance south of the Delaware-Sullivan county line, in the Catskill Mountain subprovince of the Appalachian (Allegheny) Plateau physiographic province of New York State.

The topography in the area ranges from elevation 1840 at the downstream toe of the dam to approximately elevation 2200 at the summits of the hills surrounding the dam and lake area.

The underlying bedrock at the site consists of the Slide Mountain Formation belonging to the Upper Devonian West Falls Group. This formation is the terrestrial deposit of the Catskill Delta and consists of a medium to coarse-grained, red, silty sandstone and conglomerate containing minor amounts of red silty shale. It was derived from a combination of distributary channel, floodplain, and beach deposits.

Above the bedrock, the valley bottom and side slopes are mantled by a heterogeneous mixture of clay, silt, sand and rock fragments known as glacial till, deposited at the base of ice sheets which once covered the region.

b. Subsurface Conditions

There is no record of subsurface explorations at the site of Lake Muskoday Dam; however, the original application for construction of the dam, dated January 22, 1924 and included in Appendix D, refers to "clay on surface with hard pan about 2 ft." down.

2.2 DESIGN RECORDS

Some design information from the original application for the construction of the dam is included in Appendix D. No other design records were obtained.

2.3 CONSTRUCTION RECORDS

This dam was constructed in 1925. A plan, and sections of the dam are included on page D-9 in Appendix D. No other construction records were obtained.

2.4 OPERATION RECORDS

No operation records were obtained for this dam.

2.5 EVALUATION OF DATA

The data presented herein was obtained from the files of the New York State Department of Environmental Conservation (DEC). This information appears to be reliable and adequate for the purposes of a Phase I Inspection Report.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

A visual inspection of the Lake Muskoday Dam was conducted on April 8, 1981. The weather was sunny and the temperature was 60± °F. At the time of the inspection, water was flowing in the overflow spillway (See Photos No. 7 and 9).

b. Dam

The masonry and stone fill dam structure is generally in fair condition (See Photos No. 4 and 5). There was no visible evidence of significant lateral movement or settlement, or major erosion, but there was moderate water flow from the rockfill on either side of the spillway.

The following specific items were noted:

1. Water flow estimated at a rate greater than 40 gallons per minute (GPM) was exiting from the rockfill on either side of the spillway 2 to 2.5 feet above the downstream water level (See Photo No. 12). Spillway discharge may have dispersed laterally among the rocks to contribute to this flow, but some appeared to come from the dam structure. While sediment was not evident in the flow, there was some medium to fine sand on the channel bottom where the water velocity slowed.

2. There has been local erosion of the upstream earthen embankment at and slightly above the waterline, apparently due to wave action (See Photo No. 6). Occasional exposed rocks may be partial riprap protection.

3. The partially-paved roadway along the dam crest has local shallow potholes, apparently due to traffic under wet conditions (See Photo No. 3).

4. At either end of the dam, the downstream rockfill slope has weeds and brush, some debris and at least one tree among the rock fragments (See Photos No. 10 and 11).

5. The swale between the downstream slope and the right abutment has undergone some erosion where the roadside ditch drains into the stream.

c. Overflow Spillway

The overflow spillway consists of a 17.4 foot wide broad-crested weir and rockfill apron (See Photos No. 8 and 9). A timber plank and steel beam bridge spans the weir, which was free of debris and in good condition at the time of inspection.

d. Downstream Channel

The natural channel downstream from the dam has a width of 25± feet (See Photo No. 13). The stream contains riffles and pools with bed material ranging in gradation from fine to coarse gravel with some cobbles. Immediately downstream of the dam, the bank stability is good and there are no channel obstructions.

e. Reservoir - Storage Pool Area

The lake shoreline is generally wooded or developed with cabins; it ranges from gently to steep sloping, but the steeper portions are rock-controlled and there is no significant possibility of landslides into the lake affecting the safety of the dam.

3.2 EVALUATION OF OBSERVATIONS

The visual inspection revealed several deficiencies on this structure. The following observations were made:

a. (1) Water flow estimated at greater than 40 GPM was exiting from the rockfill on either side of the overflow spillway;

b. (2) At and slightly above the waterline, there was local erosion of the upstream embankment;

c. (3) The partially-paved roadway along the dam crest has local, shallow potholes;

d. At both ends of the dam, the downstream rockfill slope has weeds, brush, some debris and at least one tree among the rock fragments;

e. (5) The swale between the downstream slope and the right abutment has undergone some erosion.

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface level is maintained by the crest of the spillway weir at elevation 1843.0 (NGVD). No operational procedures are in effect at this time.

4.2 MAINTENANCE OF DAM

There was no evidence of any routine maintenance operations directed toward the Lake Muskoday Dam structure; however, the roadway and the upstream grassed areas do appear to be maintained. In addition, a September, 1975 letter to the State indicates that the downstream rockfill may have been placed in 1975 or 1976 to reinforce the dam.

4.3 WARNING SYSTEM

No warning system is presently in effect.

4.4 EVALUATION

Presently, no operation or maintenance procedures are in effect for this dam. Therefore, a program of regular operation and maintenance procedures should be implemented.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The dam is located in the Town of Fremont on Trout Brook, approximately 7.9 miles upstream of the Beaver Kill. The Beaver Kill joins the Delaware River near the village of Hancock, approximately sixty-nine miles upstream of Port Jervis, New York.

The watershed (shown on the Watershed Map on Page C-5 in Appendix C) consists of 2,847 acres (4.45 square miles) of rolling to hilly uplands with typical slopes of 10 percent. Land within the watershed is primarily undeveloped with extensive woodlands. Tennanah Lake, which has a surface area of 166 acres (0.26 square miles), is located within the watershed 1.5± miles upstream of Lake Muskoday Dam. The only other major upstream storage area is a swamp which has an area of approximately 35 acres and is situated on a tributary to Tennanah Lake.

The watercourse upon which the reservoir is located, is a perennial stream with a typical flow width of 25 feet and a typical flow depth of 8 inches.

5.2 ANALYSIS CRITERIA

The purpose of the hydrologic/hydraulic analysis is to evaluate the spillway capacity and the potential for overtopping. The analysis of the spillway capacity of the dam and storage of the reservoir was performed using the Corps of Engineers' HEC-1 Computer Model - Dam Safety Version. The procedure included determining the Probable Maximum Flood (PMF) runoff from the watershed and routing the inflow hydrograph through the impoundment to determine the outflow hydrograph. The unit hydrograph was defined by the Snyder Synthetic Unit Hydrograph method, and the Modified Puls routing procedure was incorporated.

The initial rainfall loss was assumed to be 1.0 inches, and the uniform rainfall loss was assumed to be 0.1 inches per hour. In accordance with recommended guidelines of the Corps of Engineers, the Probable Maximum Precipitation (PMP) was 20.7 inches (24 hour duration, 200 square mile area).

The analysis was conducted for both the full PMF and for several fractional PMF conditions. The PMF inflow of 5,138 CFS was routed through the reservoir and the peak outflow was determined to be 4,687 CFS.

5.3 SPILLWAY CAPACITY

The total outlet capacity is the discharge from the overflow spillway.

The overflow spillway consists of a 17.4 foot wide broad-crested concrete weir and a rockfill apron. The weir is divided into two sections, one 8.5 feet wide and the other 8.9 feet wide, which are separated by a concrete pier for the bridge.

The stage discharge data for the overflow spillway capacity was calculated for the stages tabulated below:

Stage (Feet)	Discharge Capacity (CFS)	Element of Structure
1843.0	0	Overflow Spillway Crest
1843.5	19	--
1844.0	52	--
1844.5	96	--
1844.7	116	Bottom of Bridge
1844.9	132	--
1845.2	166	--
1845.6	189	Top of Dam

The total spillway capacity at the top of dam is 189 CFS.

5.4 RESERVOIR CAPACITY

The storage capacity of the lake was obtained from the application for the reconstruction of the dam dated May 21, 1937 for the stages indicated below:

Stage (Feet)	Storage (Acre-Feet)	Storage (Inches of Runoff)
1843.0	240	1.01
1845.6	370	1.56

5.5 FLOODS OF RECORD

No data regarding flood levels was obtained for this dam.

5.6 OVERTOPPING POTENTIAL

The results of the HEC-1 DB computer analysis indicate that the crest of the dam is overtopped by all storms exceeding 11 percent of the PMF event. The PMF discharge rate of 4,687 cubic feet per second (CFS) would occur at a peak flood stage of 1850.9 feet, which is 5.3 feet above the crest of the dam.

The results of the analysis are tabulated below:

Flood Condition	Peak Inflow (CFS)	Peak Outflow (CFS)	Maximum Stage Elevation (NGVD)
0.5 PMF	2566	2242	1848.7
1.0 PMF	5138	4687	1850.9

5.7 EVALUATION

Using the Corps of Engineers' screening criteria for the initial review of spillway adequacy, it has been determined that the capacity of the overflow spillway is not adequate to pass either the full PMF or one half the PMF; only approximately 11 percent of the outflow from the PMF can be safely passed before overtopping will occur. The PMF event would overtop the dam for a duration of 22.5 hours and the maximum depth of flow over the crest would be 5.3 feet. It is estimated that breaching of the dam as a result of overtopping, would cause water surface levels downstream to reach depths which would pose significant danger to residents. Therefore, the spillway is adjudged to be seriously inadequate and the dam is assessed as unsafe, nonemergency.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

There was no visible evidence of major settlement or lateral movement of the upstream concrete wall, or overall structural instability of the dam during the site examination. The flow from beneath the downstream rockfill on either side of the overflow spillway is not an immediate reason to question the static structural stability of the dam, but it could adversely affect stability if there is active erosion of foundation soil.

b. Design and Construction Data

The 1924 and 1975 sketches of Lake Muskoday Dam included in Appendix D, show a configuration for the dam and overflow spillway that generally corresponds to the conditions observed during the visual examination on April 8, 1981.

There is no construction data to confirm the actual physical properties and configuration of the stone fill in the dam structure. However, the dam proportions including the downstream rockfill are considered to be reasonable for the height of the structure and therefore, the dam would be expected to have adequate safety margins with respect to stability under static loading conditions.

c. Operating Records

No operating records were obtained for Lake Muskoday Dam.

d. Post Construction Changes

The only major post construction modification noted was the addition of riprap and stone masonry to the dam in 1975 and 1976.

e. Seismic Stability

The Lake Muskoday Dam is located in Seismic Zone 1 and in accordance with recommended Phase I guidelines does not require seismic analysis.

SECTION 7 - ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Condition

On the basis of the visual examination, there were no signs of impending structural failure or other conditions which would warrant urgent remedial action; however, the apparent seepage flow is a significant deficiency which should have further investigation.

b. Adequacy of Information

The evaluation of this dam is based primarily on visual examination, reference to the 1924 and 1975 sketches, approximate hydraulic and hydrologic computations, and application of engineering judgement. The available information that was obtained is adequate for the purposes of a Phase I assessment.

c. Need for Additional Investigations

It is recommended that the following additional investigations be performed by a registered professional engineer engaged by the owner:

1. Conduct a detailed hydrologic and hydraulic analysis to more accurately determine the site specific characteristics of the watershed.

2. Investigate the water flow that was evident in the downstream rockfill on either side of the spillway, including observation when lake levels vary, and determine the source of the flow, evaluate the potential for dam instability or failure and recommend remedial measures, if appropriate.

d. Urgency

It is recommended that within 3 months of the final approval date of this report, both additional investigations should be initiated and within 18 months, appropriate remedial measures should be completed. In the interim, a plan for providing around-the-clock surveillance of the dam during periods of unusually heavy precipitation should be developed and implemented. The recommended corrective measures presented in Section 7.2 should be completed within 12 months of final approval.

7.2 RECOMMENDED MEASURES

It is considered important that the following items be accomplished in addition to any items required as a result of the additional investigations recommended in Section 7.1c:

a. Clear brush, trees and debris from the downstream rockfill, and recut at least annually to maintain the cleared condition.

b. Fill and regrade the local potholes on the dam crest, and grade the roadway and its side ditches to avoid detrimental erosion at the dam.

c. Place rockfill or riprap erosion protection where the upstream earthen embankment has been eroded by wave action.

d. Develop and implement a flood warning and emergency evacuation plan to alert downstream residents in the event conditions occur which could result in failure of the dam.

e. A program for regular maintenance should be developed and implemented.

APPENDIX A

PHOTOGRAPHS

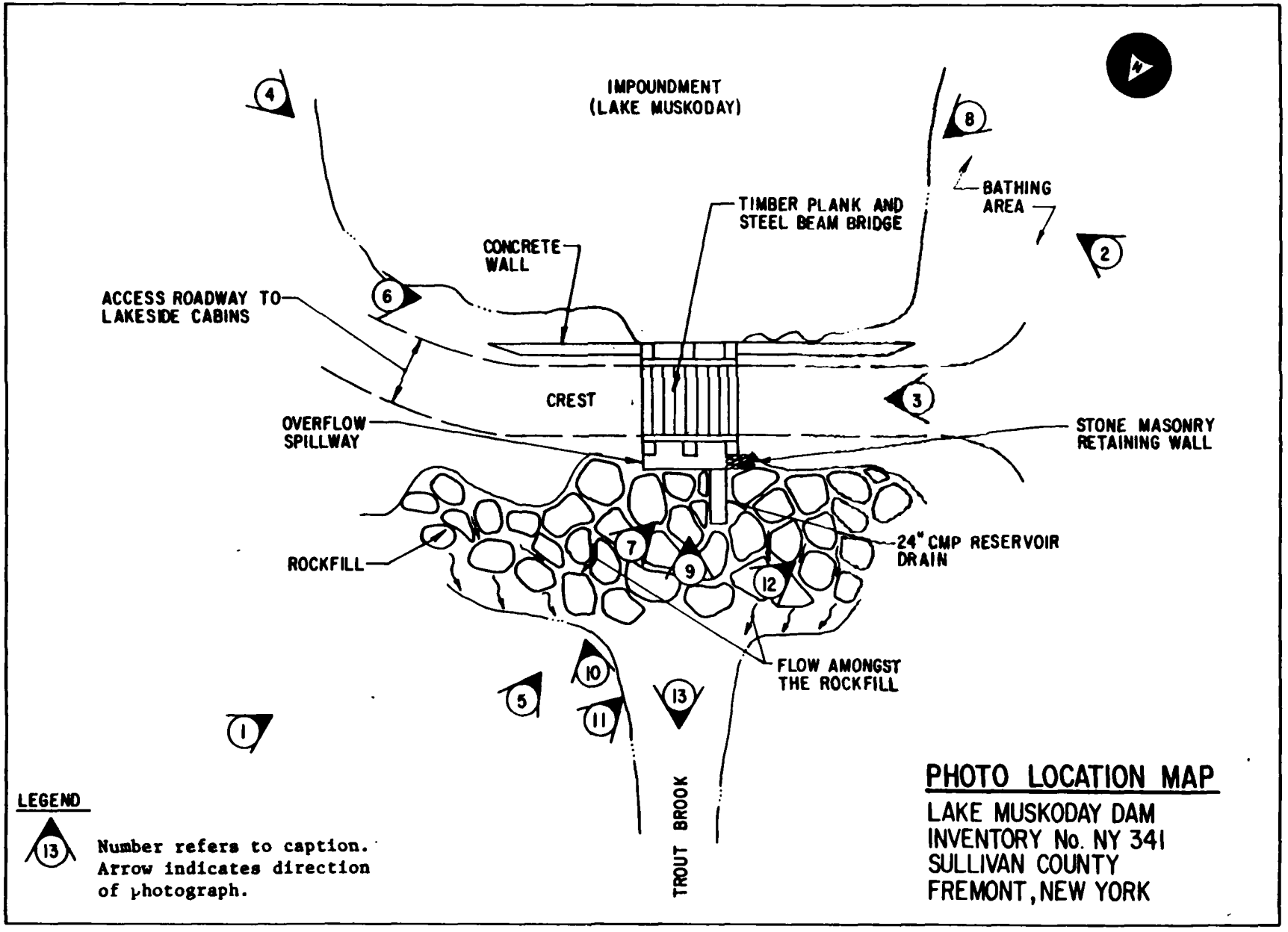

IMPOUNDMENT
(LAKE MUSKODAY)
BATHING AREA
TIMBER PLANK AND STEEL BEAM BRIDGE
CONCRETE WALL
ACCESS ROADWAY TO LAKESIDE CABINS
CREST
OVERFLOW SPILLWAY
STONE MASONRY RETAINING WALL
ROCKFILL
24" CMP RESERVOIR DRAIN
FLOW AMONGST THE ROCKFILL
TROUT BROOK
LEGEND
Number refers to caption. Arrow indicates direction of photograph.
PHOTO LOCATION MAP
LAKE MUSKODAY DAM
INVENTORY No. NY 341
SULLIVAN COUNTY
FREMONT, NEW YORK

PHOTO #2: Overview of beach area and impoundment

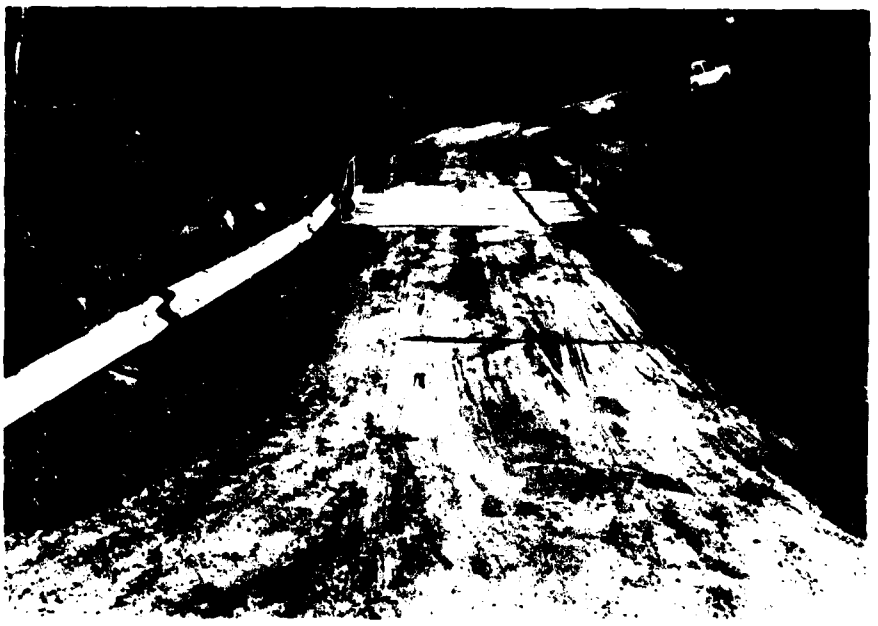


PHOTO #3: Crest of dam looking toward right abutment

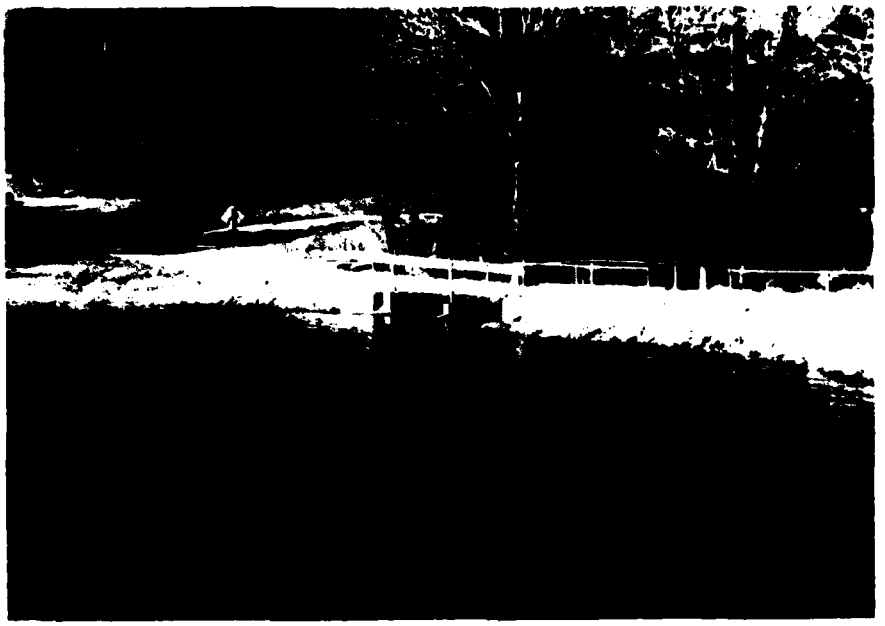


PHOTO #4: Overview of upstream face of dam

PHOTO #5: Overview of downstream face of dam

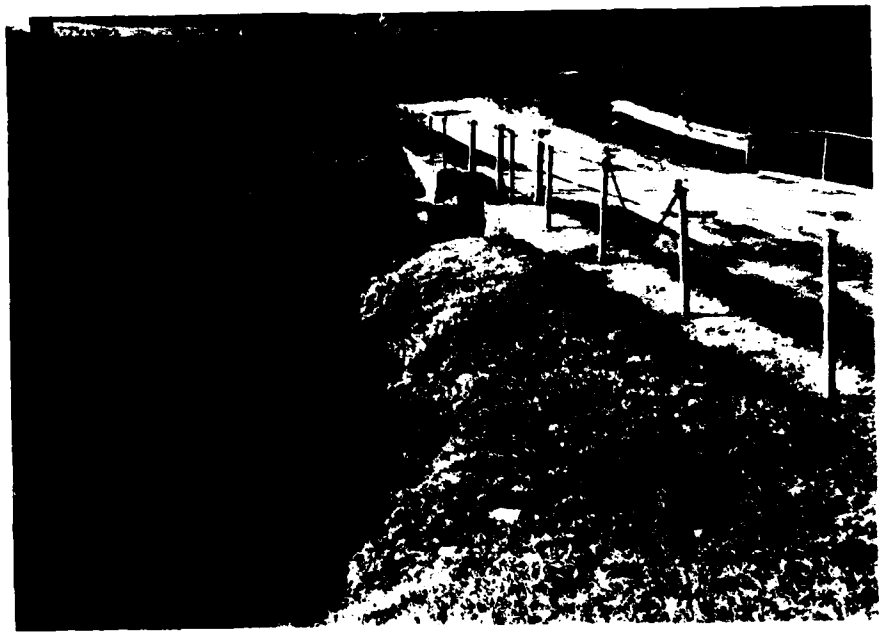


PHOTO #6: Upstream face of dam

PHOTO #7: Downstream face of dam

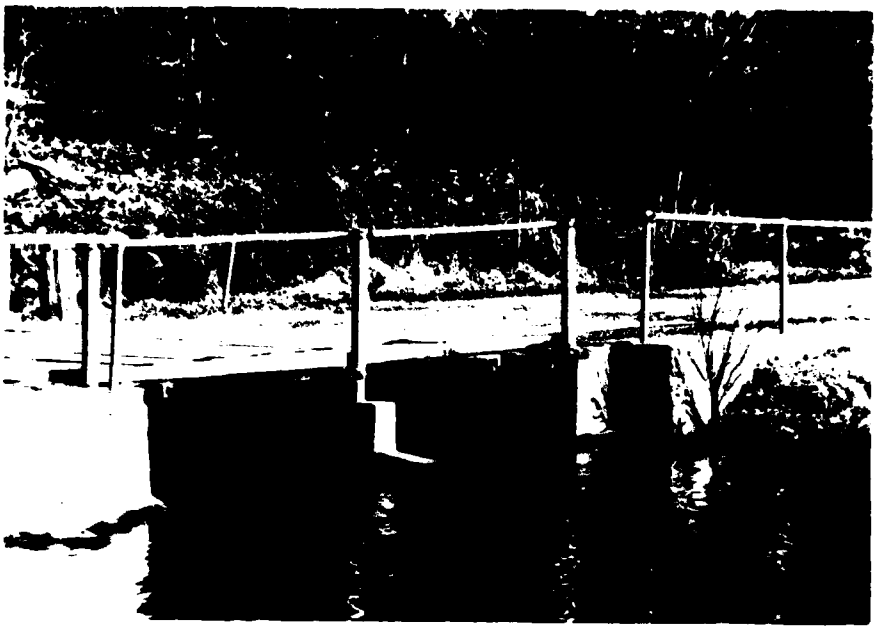


PHOTO #8: Spillway from upstream

PHOTO #9: Spillway from downstream

PHOTO #10: Rockfill on downstream slope at right abutment

PHOTO #11: Rockfill on downstream slope at left abutment

PHOTO #12: Water flowing from under rockfill at left abutment

PHOTO #13: Downstream channel conditions

APPENDIX B

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) **Basic Data**

a. **General**

Name of Dam: Lake Muskoday Dam

Fed. I.D. #: NY 341 DEC Dam No.: 147A-413

River Basin: Delaware

Location: Town: Fremont County: Sullivan

Stream Name: Trout Brook

Tributary of: Beaver Kill

Latitude (N): 41° - 54.8' Longitude (W): 74° - 59.7'

Type of Dam: Stone fill between concrete and stone masonry walls with a concrete overflow spillway

Hazard Category: High

Date(s) of Inspection: April 8, 1981

Weather Conditions: Sunny, 60° ± F.

Reservoir Level at Time of Inspection: Elevation 1483.1 ± (NGVD)

b. Inspection Personnel: T.L.Ward & R.A. Criscuolo of Flaherty Giavara Associates, P.C.; P. L. LeCount of Haley & Aldrich, Inc.; B. McL. Whittingham of Salmon Associates

c. Persons Contacted (Including Address & Phone No.):

None

d. History:

Date Constructed: 1925 Date(s) Reconstructed: Never

Designer: Unknown

Constructed By: Unknown

Owner: Lake Muskoday Bungalow Colony, Inc.

2) Embankment

a. Characteristics

(1) Embankment Material Stone fill between stone masonry and concrete walls

(2) Cutoff Type Concrete wall extends to "hardpan"

(3) Impervious Core Upstream concrete wall

(4) Internal Drainage System None observed

(5) Miscellaneous No comments

b. Crest

(1) Vertical Alignment Good; except for local small depressions (potholes)

(2) Horizontal Alignment Good; substantially straight

(3) Surface Cracks None observed

(4) Miscellaneous Small depressions (potholes) apparently from traffic during wet conditions; grass at edge of road

c. Upstream Slope

(1) Slope (Estimate - V:H) Irregular

(2) Undesirable Growth or Debris, Animal Burrows Grass above and below embedded concrete wall; no animal burrows were noted

(3) Sloughing, Subsidence or Depressions Grass is undercut by wave action at edge of water

(4) Slope Protection Occasional rock at water's edge, may be result of erosion

(5) Surface Cracks or Movement at Toe None evident

d. Downstream Slope

(1) Slope (Estimate - V:H) 1:2 to 1:3

(2) Undesirable Growth or Debris, Animal Burrows Brush, grass and weeds among large rock fragments and some debris

(3) Sloughing, Subsidence or Depressions Erosion below right abutment where roadway ditch drains down to stream

(4) Surface Cracks or Movement at Toe None apparent; although rock slabs below right abutment may have been displaced

(5) Seepage Moderate flow through rockfill on either side of spillway (estimated at 40 GPM for each side); no obvious sediment in flow, but some medium to fine sand on bottom where velocity decreases

(6) External Drainage System (Ditches, Trenches, Blanket) None observed

(7) Condition Around Outlet Structure Rockfill slope and apron

(8) Seepage Beyond Toe None evident

e. Abutments - Embankment Contact

Left: good condition

Right: good condition

(1) Erosion at Contact Described in 2)d. (3)

(2) Seepage Along Contact None obvious; however, seepage through rockfill described in 2)d.(5) may also be along abutment contacts

3) Drainage System

a. Description of System Broad-crested concrete weir and rockfill discharge slope and apron leading to the natural streambed

b. Condition of System Good

c. Discharge from Drainage System Rockfill discharge slope dropping approximately 10 feet from weir to streambed

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Peizometers, Etc.)

None observed

5) Reservoir

a. Slopes Rock-controlled steep slopes to gentle, wooded slopes and lakeside cabins border the impoundment

b. Sedimentation Possible accumulation of sediment behind the dam

c. Unusual Conditions Which Affect Dam None noted

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) Approximately 4 dwellings, and three roads are within the dam failure flood hazard area

b. Seepage, Unusual Growth None observed

c. Evidence of Movement Beyond Toe of Dam None evident

d. Condition of Downstream Channel Good; fine to coarse gravel streambed material with some cobbles; no obstructions

7) Spillway(s) (Including Discharge Conveyance Channel)

Overflow spillway and discharge channel

a. General Overflow spillway and discharge channel handle all flows

b. Condition of Overflow Spillway Good; no signs of deterioration

c. Condition of Emergency Spillway Not applicable

d. Condition of Discharge Conveyance Channel Good condition, presently stable

8) Reservoir Drain/Outlet

Type: Pipe X Conduit _____ Other _____

Material: Concrete _____ Metal Corrugated Metal Other _____

Size: 24 inch Length 25 feet

Invert Elevations: Entrance Submerged Exit 1839.3+ (NGVD)

Physical Condition (Describe): Unobservable _____

Material: Good

Joints: Unknown Alignment Good, for visible section

Structural Integrity: Appears to be good

Hydraulic Capability: Appears to be good

Means of Control: Gate "Stop boards" Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable _____ Uncontrolled _____

Present Condition (Describe): Good; however, the "stop boards" were not removed during the inspection

9) Structural

a. Concrete Surfaces Concrete of the overflow spillway is in good condition with only very minor spalling

b. Structural Cracking No evidence of any structural cracks

c. Movement - Horizontal & Vertical Alignment (Settlement) None apparent

d. Junctions with Abutments or Embankments Good condition; one-eighth inch vertical separation at northeast corner

e. Drains - Foundation, Joint, Face None evident

f. Water Passages, Conduits, Sluices Good condition

g. Seepage or Leakage Described in 2) d. (5)

h. Joints - Construction, etc. Good condition; but slight mismatch (gap) between parapet and left end of spillway deck

i. Foundation Inaccessible

j. Abutments See 9) d. above

k. Control Gates None observed

l. Approach & Outlet Channels Not applicable

m. Energy Dissipators (Plunge Pool, etc.) Overflow spillway discharges to rockfill slope and apron

n. Intake Structures Not applicable

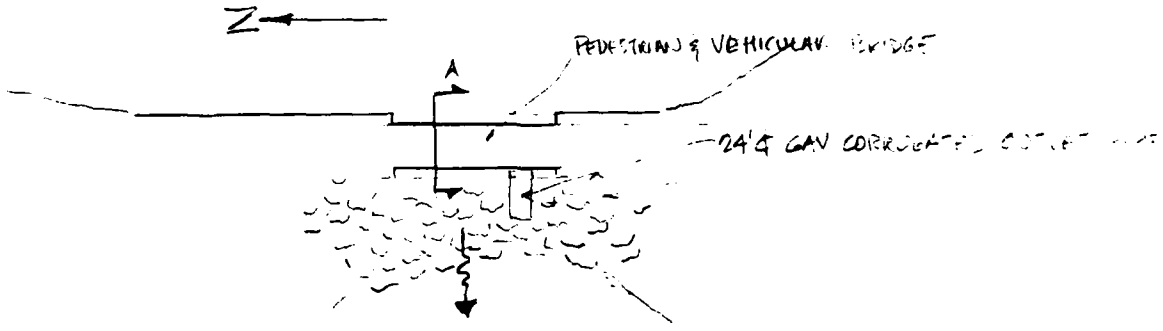
o. Stability Appears to be stable

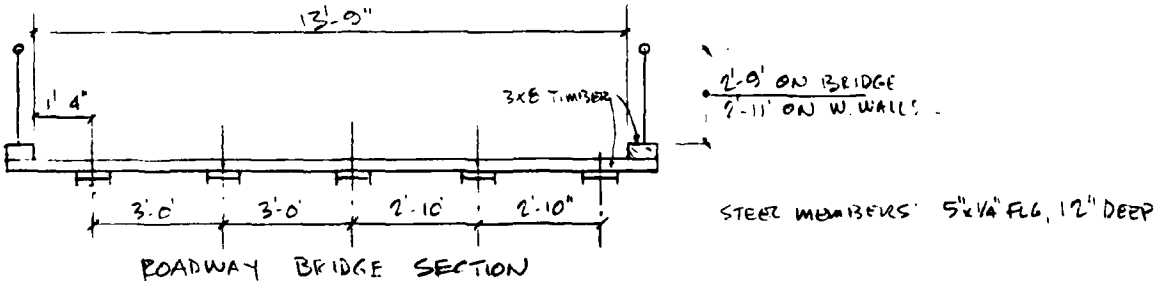
p. Miscellaneous No comments

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

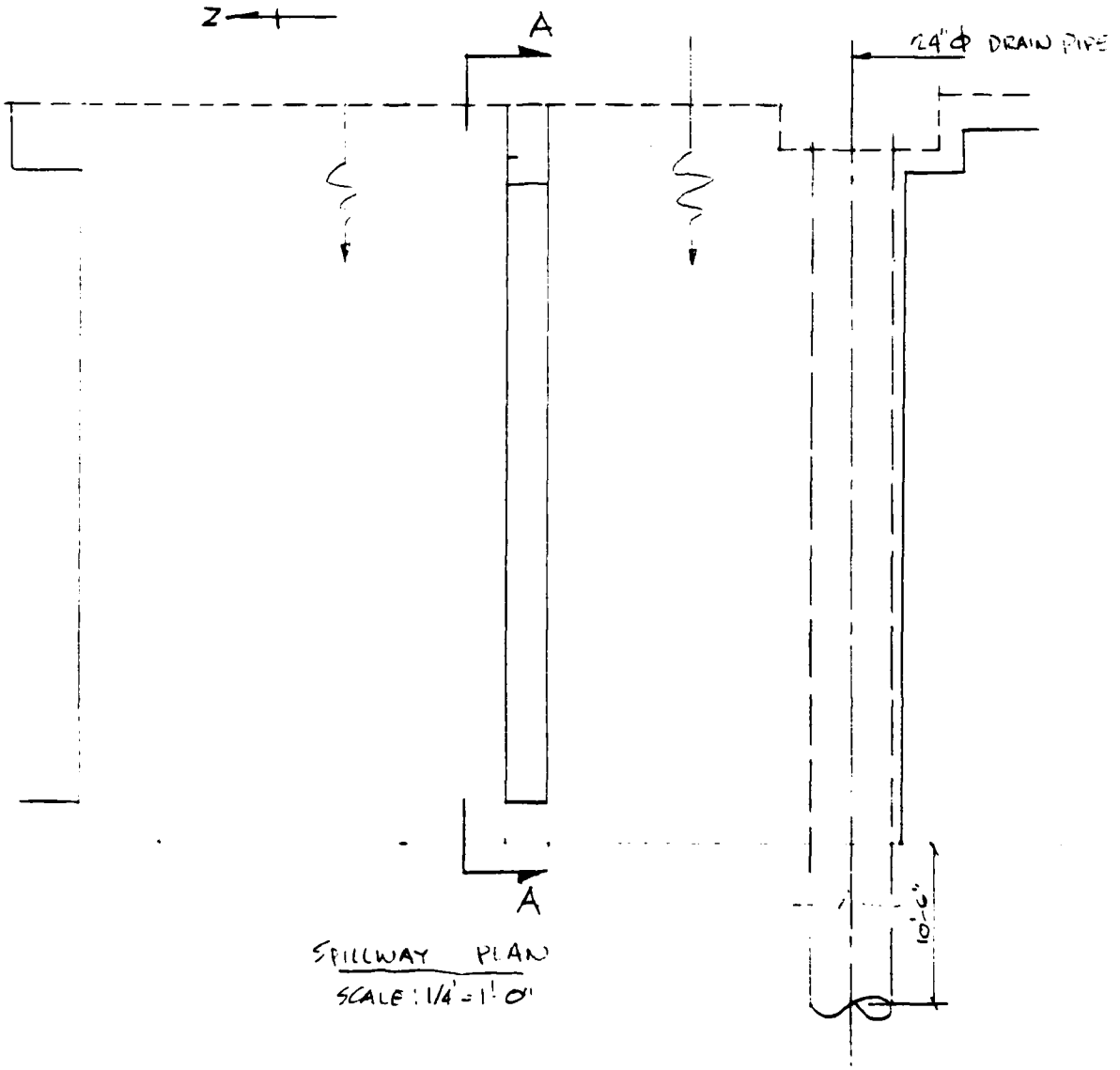
a. Description and Condition None observed

LAKE MUSKRAT



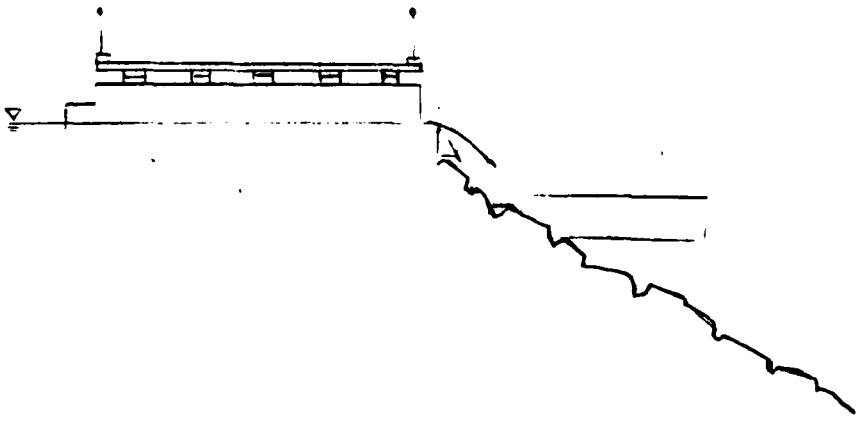


ROADWAY BRIDGE SECTION



SPILLWAY PLAN

SCALE: 1/4" = 1'-0"



APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	1845.6	57	370
2) Design High Water (Max. Design Pool)	--	--	--
3) Emergency Spillway Crest	--	--	--
4) Pool Level with Flashboards	--	--	--
5) Overflow Spillway Crest	1843.0	50	240

DISCHARGES:

	Volume (cfs)
1) Average Daily	Unknown
2) Overflow Spillway @ Maximum High Water (Top of Dam)	189
3) Emergency Spillway @ Design High Water	--
4) Principal Spillway @ Emergency Spillway Crest	--
5) Low Level Outlet @ Principal Spillway Crest	25
6) Total (of all facilities) @ Maximum High Water	214
7) Maximum Known Flood	Unknown
8) At Time of Inspection	2+

CREST: ELEVATION: 1845.6 (NGVD)

Type: Earthen crest above embankment of stone fill between concrete and stone masonry wall

Width: 20 feet Length: 155 feet

Spillover: Concrete overflow spillway weir

Location: Center of embankment

SPILLWAY:

OVERFLOW		EMERGENCY
1843.0 (NGVD)	Elevation	
Broad-crested weir	Type	
20 feet	Width	
	Type of Control	
Weir	Uncontrolled	
--	Controlled	
None	Type: (Flashboards; gate)	
One	Number	
17.4 foot weir	Size/Length	
Concrete	Invert Material	
Continuously	Anticipated Length of Operating Service	
Unknown	Chute Length	
Unknown	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	

Type: _____

Location: _____

Records:

Date Unknown

Max. Reading Unknown

FLOOD WATER CONTROL SYSTEM:

Warning System None in effect

Method of Controlled Releases (mechanisms) "Stop boards" control the reservoir drain

DRAINAGE AREA: 2,847 acres = 4.45 square miles

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Rural, Woodlands

Terrain - Relief: Rolling to hilly uplands

Surface - Soil: Glacial till

Runoff Potential (existing or planned extensive alterations to existing surface or subsurface conditions)

Primarily woodlands with scattered open fields; glacial till soils; average watershed slope is 10 ± percent, some residential homes and roadways; some future development around lake possible

Potential Sedimentation problem areas (natural or man-made; present or future)

None

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

Flooding of some lakeside cabins is possible

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the reservoir perimeter:

Location: None

Elevation:

Reservoir:

Length @ Maximum Pool: 4500 ± feet = 0.9 miles (Miles)

Length of Shoreline (@ Spillway Crest): 10,500 ± feet=2.0 miles (Miles)

WATERSHED MAP

LAKE MUSKODAY DAM
INVENTORY No. NY 341

DELAWARE RIVER BASIN
SULLIVAN COUNTY
FREMONT, NEW YORK

FLAHERTY · GIAVARA ASSOCIATES, P.C.

CALCULATIONS

FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CONN 06510/203/789-1260

Watershed Data - Lake Muskoday
For HEC-1 Snyder Hydrograph

Inflow To Tennanah Lake

$L = 6000$ FT $= 1.14$ miles
$L_c = 2000$ FT $= 0.38$ miles
$C_p = 2.0$ for average slopes

1) $T_p = 2.0 (1.14 \times 0.38)^{0.3}$
$= 1.56$ Hours

$t_r = \frac{t_p}{5.5} = \frac{1.56}{5.5} = 0.28$ USE $t_R = 0.5$

$t_{pR} = t_p + 0.25 (t_R - t_r)$
$= 1.56 + 0.25 (0.5 - 0.28)$
$= 1.62$ Hours

2) $C_p = 0.63$ For Highland Area

3) % Impervious - Tennanah Lake

Roads	36,000 LF × 25′ =	900,000 ft²
Houses	± 125 @ 1000 ft² =	125,000 ft²
		1,025,000 ft²

1,025,000 ft² = 23.5 acres

$\frac{23.5 \text{ acres}}{1643.7 \text{ acres}} = 1.4\%$

4) Watershed Area - Tennanah Lake

1643.7 acres / 640 = 2.57 Square miles

Based on 1" = 2000′ USGS MAP

FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CONN 06510/203/789-1260

Inflow To Lake Muskoday

L = 4500 ft = 0.85 miles
L_c = 2000 ft = 0.38 miles
C_T = 2.0 for average slopes

5) $T_p = C_T (L \times L_c)^{0.3}$
$= 2.0 (0.85 \times 038)^{0.3} = 1.42$ Hours

$t_r = \frac{t_p}{5.5} = \frac{1.42}{5.5} = 0.26$ USE $t_R = 0.5$

$t_{pR} = t_p + 0.25 (t_R - t_r)$
$= 1.42 + 0.25 (0.5 - 0.26)$
$= 1.48$ Hours

6) C_p = 0.63 For Highland Area

7) % Impervious - Lake Muskoday

Roads	18,000 LF × 25 LF	= 450,000 FT²
Houses	±70 @ 1000 FT²	= 70,000 FT²
		520,000 FT²

520,000 FT² = 11.9 AC

8) Watershed Area - Lake Muskoday

12029 AC / 640 = 1.88 Square Miles

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9) Rainfall Data

(From Hydrometeorological Report No. 33)

24 Hour Duration PMP = 20.7 inches
for 200 Square Miles

Duration (Hours)	Adj Factor %
6	111
12	122
24	133
48	143

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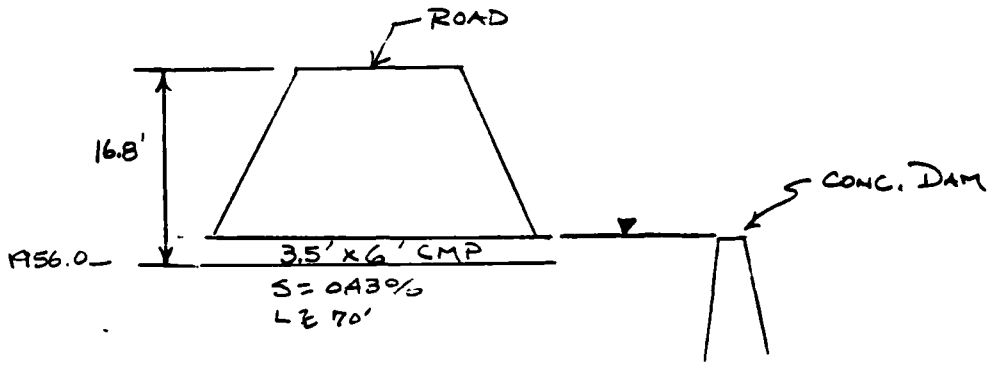
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CONN 06510/203/789-1260

TENNANAH LAKE STAGE-DISCHARGE DATA

FOR HEC-DB, ROUTE THROUGH TENNANAH LAKE FIRST, THEN ROUTE THROUGH LAKE MUSKODAY



① OUTLET CONTROLS

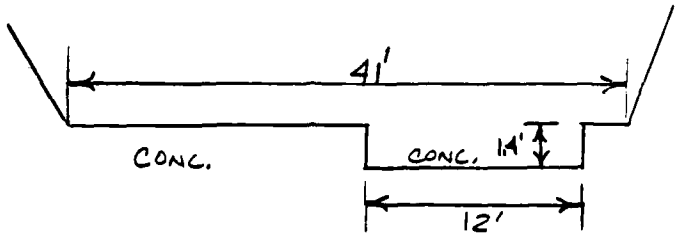
USING NOMOGRAPHS FOUND IN U.S DEPARTMENT OF TRANSPORTATION 'HYDRAULIC CHARTS FOR THE SELECTION OF HIGHWAY CULVERTS, HYDRAULIC ENGINEERING CIRCULAR NO. 5', THE FOLLOWING DISCHARGES WERE READ.

STAGE	Discharge
1956.0	0
1959.5	35
1963.2	50
1963.7	53
1964.7	115
1965.7	142
1966.7	165
1967.7	185
1968.7	200
1969.7	220
1970.7	240
1971.7	250
1972.7	270
1973.7	280
1974.7	300
1975.7	305

FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CONN 06510/203/789-1260

TENNANAH LAKE CONT.

② CHECK OUTFLOW OF CONC. DAM



A) IF $H = 3.0'$ $Q = ?$

$Q = CLH^{1.5}$

$Q_1 = (3)(12)H^{1.5}$
$= 36H^{1.5}$
$= 36(3)^{1.5}$
$= 187$

$Q_2 = CLH^{1.5}$
$Q_2 = (3)(29)H^{1.5}$
$= 87H^{1.5}$
$= 87(1.6)^{1.5}$
$= 176$

$Q_T = 187 + 176 = 363$ CFS

B) 363 CFS > 305 CFS ∴ FLOW THROUGH THE CMP CONTROLS.

PROJECT Corps Dams
NY 341
Lake Muskoday

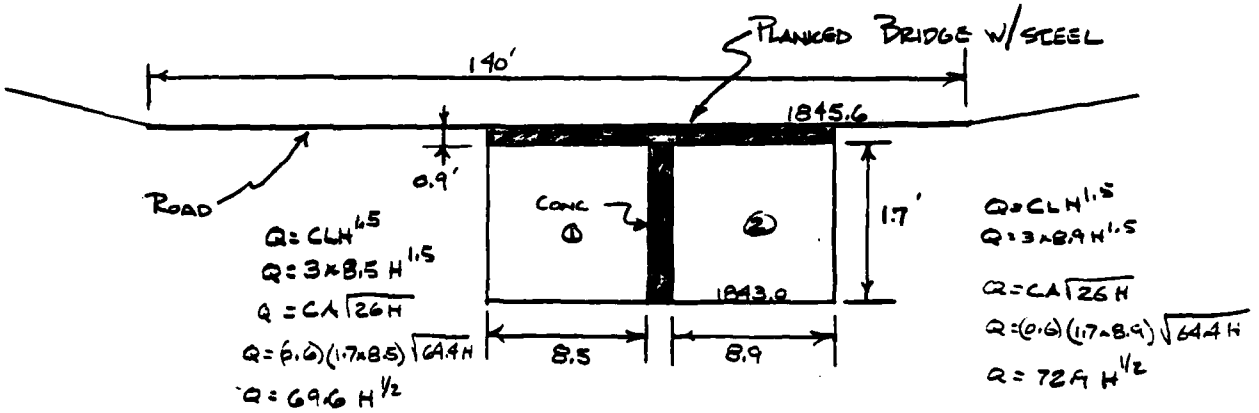
FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CONN 06510/203/789-1260

SHEET NO. 6 OF 8
BY RAC DATE 5-4-81
CHK'D. BY TLW DATE 5-11-81

Lake Muskoday

Stage Discharge Data

NTS



Stage Discharge - Spillway Section & Dam Overtoping

Stage	$Q=3(8.5)H^{1.5}$	$Q_2=3(8.9)H^{1.5}$	$Q_1=69.6H^{1/2}$	$Q_2=72.9H^{1/2}$	$Q_t=2.5(140)H^{1.5}$	Discharge
1843.0						0
1843.5	$3(8.5)(.5)^{1.5}$	$3(8.9)(.5)^{1.5}$				18.5
1844.0	$3(8.5)(1)$	$3(8.9)(1)$				52.2
1844.5	$3(8.5)(1.5)^{1.5}$	$3(8.9)(1.5)^{1.5}$				95.9
1844.7	$3(8.5)(1.7)^{1.5}$	$3(8.9)(1.7)^{1.5}$				115.7
1844.75			*$69.6(0.9)^{1/2}$	*$72.9(0.9)^{1/2}$		135.2
1845.2			$69.6(1.35)^{1/2}$	$72.9(1.35)^{1/2}$		165.6
1845.6	← (Top of Dam)		$69.6(1.75)^{1/2}$	$72.9(1.75)^{1/2}$		188.5
1846.0			$69.6(2.15)^{1/2}$	$72.9(2.15)^{1/2}$	*$2.5(140)(0.4)^{1.5}$	297.5
1847.0			$69.6(3.15)^{1/2}$	$72.9(3.15)^{1/2}$	$2.5(140)(1.4)^{1.5}$	832.7
1848.0			$69.6(4.15)^{1/2}$	$72.9(4.15)^{1/2}$	$2.5(140)(2.4)^{1.5}$	1591.6
1849.0			$69.6(5.15)^{1/2}$	$72.9(5.15)^{1/2}$	$2.5(140)(3.4)^{1.5}$	2517.6
1850.0			$69.6(6.15)^{1/2}$	$72.9(6.15)^{1/2}$	$2.5(140)(4.4)^{1.5}$	3583.7

* An orfice flow condition was assumed to exist for stages equal to the bottom of the bridge. Both orfice and weir flow conditions were assumed to exist for stages greater than top of the bridge.

PROJECT Corps Dams
NY 341
Lake Muskoday

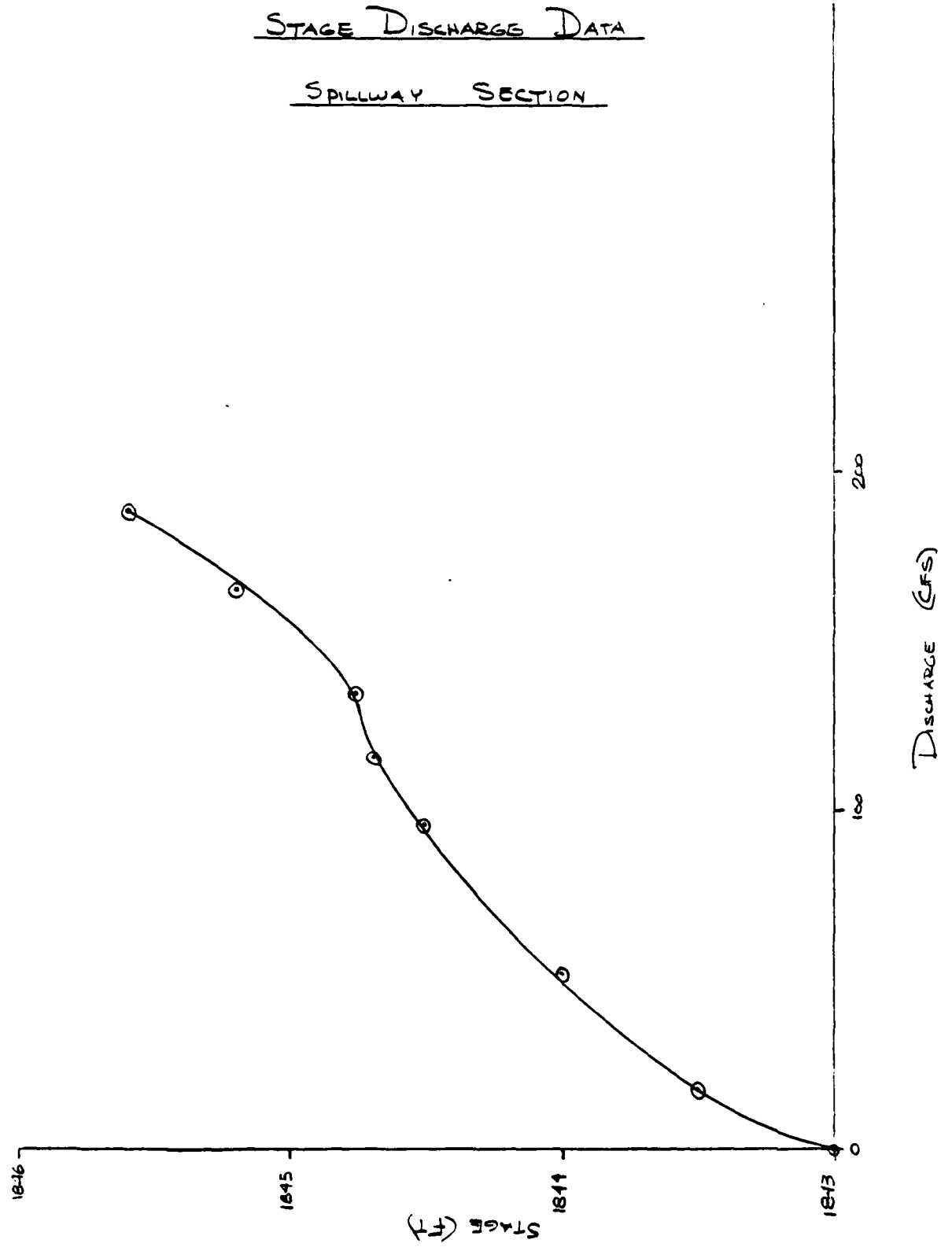
FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CONN 06510/203/789-1260

SHEET NO. 7 OF 8
BY RAC DATE 5-4-81
CHK'D. BY TLW DATE 5-11-81

Lake Muskoday

Stage Discharge Data

Spillway Section



PROJECT CORPS DAMS
NY 341
LAKE MUSKODAY

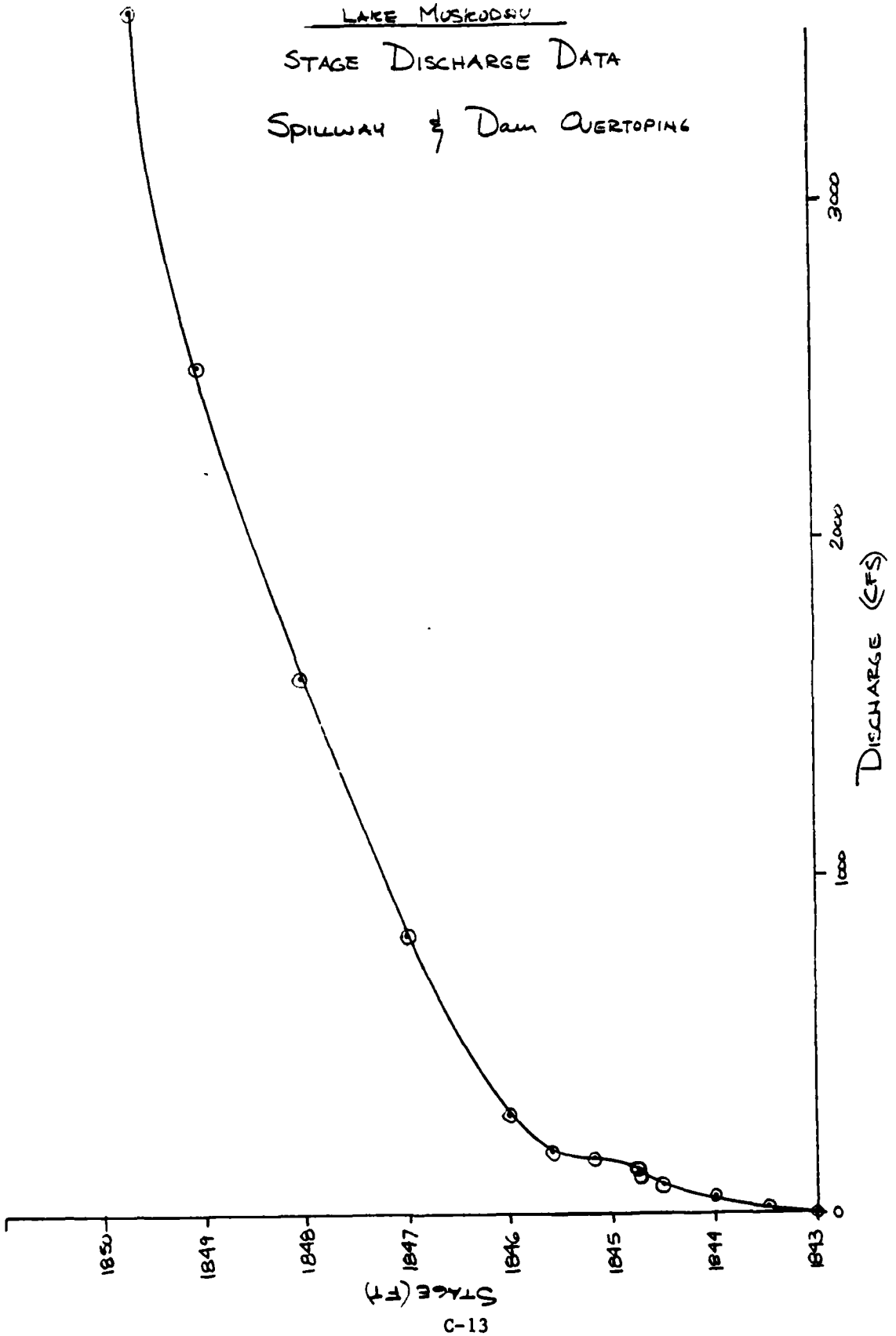
FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CONN. 06510/203/789-1260

SHEET NO. 8 OF 8
BY RAC DATE 5-4-81
CHK'D. BY TLW DATE 5-11-81

LAKE MUSKODAY

STAGE DISCHARGE DATA

SPILLWAY & DAM OVERTOPING



HEC-1 FLOOD HYDROGRAPH COMPUTATIONS

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FLAHERTY GIAVARA ASSOCIATES, P.C.
**********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  26 FEB 79
**********************************
     1                A1  NATIONAL DAM INSPECTION PROGRAM, PHASE I REPORT, CORPS OF ENGINEERS - NEW YORK DISTRICT
     2                A2  DAM INVENTORY NO. NY 341, LAKE MUSKODAY DAM, SULLIVAN COUNTY, NEW YORK, JULY 23, 1981
     3                A3  PREPARED BY FLAHERTY GIAVARA ASSOCIATES, P.C., ONE COLUMBUS PLAZA, NEW HAVEN, CONNECTICUT
     4                B     120       0      30       0       0       0       0       2       0       0
     5                B1      5
     6                J       1       9       1
     7                J1  0.05    0.09    0.10    0.11    0.12    0.13    0.20    0.50    1.00
     8                K       0       1                               0       0       1       0
     9                K1  INFLOW HYDROGRAPH, TENNANAH LAKE - SNYDER METHOD
    10                M       1       1    2.57                       0                               1
    11                P       0    20.7     111     122     133     143
    12                T                                                                   1     0.1           0.014
    13                W    1.62    0.63
    14                X    -2.0   -0.10     1.5                       0       0       1       0
    15                K       1       1
    16                K1  TENNANAH LAKE ROUTING - MODIFIED PULS METHOD
    17                Y                                       1       1                       0      -1
    18                Y1      1
    19                Y41936.0  1959.5  1963.2  1963.7  1964.7  1965.7  1966.7  1967.7  1968.7  1969.7
    20                Y41970.7  1971.7  1972.7  1973.7  1974.7  1975.7
    21                Y5      0    39.0    60.0    83.0   113.0   142.0   165.0   185.0   200.0   220.0
    22                Y5  240.0   250.0   270.0   280.0   300.0   305.0
    23                $A  156.1   183.7   293.3
    24                $E1956.0  1960.0  1980.0
    25                $$1956.0
    26                $D1972.8     2.5     1.5     100                       0       0       1       0
    27                K       0       2
    28                K1  INFLOW HYDROGRAPH, LAKE MUSKODAY - SNYDER METHOD
    29                M       1       1    1.88                       0                               1
    30                P       0    20.7     111     122     133     143
    31                T                                                                   1     0.1           0.01
    32                W    1.48    0.63
    33                X    -2.0   -0.10     1.5                       0       0       1       0
    34                K       2       2
    35                K1  OUTFLOW FROM TENNANAH LAKE COMBINED WITH INFLOW AT LAKE MUSKODAY
    36                K       1       2                               0       0       1       0
    37                K1  LAKE MUSKODAY ROUTING - MODIFIED PULS METHOD
    38                Y                                       1       1                       0      -1
    39                Y1      1
    40                Y41843.0  1843.5  1844.0  1844.5  1844.7 1844.75  1845.2  1845.6  1846.0  1847.0
    41                Y41848.0  1849.0  1850.0
    42                Y5      0    18.5    32.2    95.9   104.0   135.2   165.6   188.5   208.9   232.9
    43                Y5  270.3   323.8   393.4
    44                $A   49.6    96.4   154.3
    45                $E1843.0  1860.0  1880.0
    46                $$1843.0
    47                $D1845.6     2.5     1.5   140.0
    48                K      99
                                PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS
                                        RUNOFF HYDROGRAPH AT          1
                                        ROUTE HYDROGRAPH TO           1
                                        RUNOFF HYDROGRAPH AT          2
```

COMBINE 2 HYDROGRAPHS AT 2
ROUTE HYDROGRAPH TO 2
END OF NETWORK

****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79
****

RUN DATE: 8/20/
TIME: 3:52 PM

NATIONAL DAM INSPECTION PROGRAM, PHASE I REPORT CORPS OF ENGINEERS
DAM INVENTORY NO. NY 341, LAKE MUSKODAY DAM, SULLIVAN COUNTY, NEW YORK
PREPARED BY FLAHERTY GIAVARA ASSOCIATES, P.C., NEW HAVEN, CONNECTICUT

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
120	0	30	0	0	0	0	2	0	0

JOPER	NWT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 9 LRTIO= 1

RTIOS=	0.05	0.09	0.10	0.11	0.12	0.13	0.20	0.50	1.00

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH, TENNANAH LAKE - SNYDER METHOD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDQ	IUHQ	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	2.57	0.00	2.57	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	20.70	111.00	122.00	133.00	143.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.10	0.00	0.01

UNIT HYDROGRAPH DATA
TP= 1.62 CP=0.63 NTA= 0

RECESSION DATA
STRTQ= -2.00 QRCSN= -0.10 RTIOR= 1.50
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 3.90 AND R= 2.87 INTERVALS

UNIT HYDROGRAPH 18 END-OF-PERIOD ORDINATES, LAG= 1.62 HOURS, CP= 0.63 VOL= 1.00

90. 318. 548. 622. 515. 362. 259. 179. 126. 89.
62. 44. 31. 22. 15. 11. 8. 5.

MO. DA	HR. MN	PERIOD	RAIN	EXCS	LOSS	END-OF-PERIOD FLOW COMP Q
1.01	0.30	1	0.00	0.00	0.00	5.
1.01	1.00	2	0.00	0.00	0.00	5.
1.01	1.30	3	0.00	0.00	0.00	5.
1.01	2.00	4	0.00	0.00	0.00	4.
1.01	2.30	5	0.00	0.00	0.00	4.
1.01	3.00	6	0.00	0.00	0.00	4.
1.01	3.30	7	0.00	0.00	0.00	4.
1.01	4.00	8	0.00	0.00	0.00	4.
1.01	4.30	9	0.00	0.00	0.00	4.
1.01	5.00	10	0.00	0.00	0.00	4.
1.01	5.30	11	0.00	0.00	0.00	3.
1.01	6.00	12	0.00	0.00	0.00	3.
1.01	6.30	13	0.01	0.00	0.01	3.
1.01	7.00	14	0.01	0.00	0.01	3.
1.01	7.30	15	0.01	0.00	0.01	3.
1.01	8.00	16	0.01	0.00	0.01	3.
1.01	8.30	17	0.01	0.00	0.01	3.
1.01	9.00	18	0.01	0.00	0.01	3.
1.01	9.30	19	0.01	0.00	0.01	3.
1.01	10.00	20	0.01	0.00	0.01	3.
1.01	10.30	21	0.01	0.00	0.01	3.
1.01	11.00	22	0.01	0.00	0.01	3.
1.01	11.30	23	0.01	0.00	0.01	3.
1.01	12.00	24	0.01	0.00	0.01	2.
1.01	12.30	25	0.07	0.00	0.07	2.
1.01	13.00	26	0.07	0.00	0.07	3.
1.01	13.30	27	0.08	0.00	0.08	3.
1.01	14.00	28	0.08	0.00	0.08	4.
1.01	14.30	29	0.10	0.00	0.10	4.
1.01	15.00	30	0.10	0.00	0.10	4.
1.01	15.30	31	0.13	0.00	0.12	5.
1.01	16.00	32	0.40	0.20	0.20	23.
1.01	16.30	33	0.10	0.05	0.05	74.
1.01	17.00	34	0.10	0.05	0.05	135.
1.01	17.30	35	0.08	0.03	0.05	173.
1.01	18.00	36	0.08	0.03	0.05	173.
1.01	18.30	37	0.01	0.00	0.01	153.
1.01	19.00	38	0.01	0.00	0.01	126.
1.01	19.30	39	0.01	0.00	0.01	98.
1.01	20.00	40	0.01	0.00	0.01	71.
1.01	20.30	41	0.01	0.00	0.01	50.
1.01	21.00	42	0.01	0.00	0.01	36.
1.01	21.30	43	0.01	0.00	0.01	26.
1.01	22.00	44	0.01	0.00	0.01	18.
1.01	22.30	45	0.01	0.00	0.01	17.
1.01	23.00	46	0.01	0.00	0.01	16.
1.01	23.30	47	0.01	0.00	0.01	15.
1.02	0.00	48	0.01	0.00	0.01	15.
1.02	0.30	49	0.06	0.01	0.05	14.
1.02	1.00	50	0.06	0.01	0.05	14.
1.02	1.30	51	0.06	0.01	0.05	13.
1.02	6.30	61	0.15	0.10	0.05	46.
1.02	7.00	62	0.15	0.10	0.05	75.
1.02	7.30	63	0.15	0.10	0.05	125.
1.02	8.00	64	0.15	0.10	0.05	182.
1.02	8.30	65	0.15	0.10	0.05	229.
1.02	9.00	66	0.15	0.10	0.05	262.
1.02	9.30	67	0.15	0.10	0.05	285.
1.02	10.00	68	0.15	0.10	0.05	301.
1.02	10.30	69	0.15	0.10	0.05	313.
1.02	11.00	70	0.15	0.10	0.05	321.
1.02	11.30	71	0.15	0.10	0.05	326.
1.02	12.00	72	0.15	0.10	0.05	330.
1.02	12.30	73	0.92	0.87	0.05	402.
1.02	13.00	74	0.92	0.87	0.05	649.
1.02	13.30	75	1.10	1.05	0.05	1087.
1.02	14.00	76	1.10	1.05	0.05	1624.
1.02	14.30	77	1.38	1.33	0.05	2145.
1.02	15.00	78	1.38	1.33	0.05	2625.
1.02	15.30	79	1.68	1.63	0.05	3094.
1.02	16.00	80	5.31	5.26	0.05	3891.
1.02	16.30	81	1.29	1.24	0.05	5134.
1.02	17.00	82	1.29	1.24	0.05	6230.
1.02	17.30	83	1.01	0.96	0.05	6553.
1.02	18.00	84	1.01	0.96	0.05	6043.
1.02	18.30	85	0.09	0.04	0.05	5200.
1.02	19.00	86	0.09	0.04	0.05	4307.
1.02	19.30	87	0.09	0.04	0.05	3360.
1.02	20.00	88	0.09	0.04	0.05	2476.
1.02	20.30	89	0.09	0.04	0.05	1783.
1.02	21.00	90	0.09	0.04	0.05	1293.
1.02	21.30	91	0.09	0.04	0.05	949.
1.02	22.00	92	0.09	0.04	0.05	706.
1.02	22.30	93	0.09	0.04	0.05	637.
1.02	23.00	94	0.09	0.04	0.05	612.
1.02	23.30	95	0.09	0.04	0.05	587.
1.03	0.00	96	0.09	0.04	0.05	564.
1.03	0.30	97	0.00	0.00	0.00	542.
1.03	1.00	98	0.00	0.00	0.00	520.
1.03	1.30	99	0.00	0.00	0.00	499.
1.03	2.00	100	0.00	0.00	0.00	480.
1.03	2.30	101	0.00	0.00	0.00	461.
1.03	3.00	102	0.00	0.00	0.00	442.
1.03	3.30	103	0.00	0.00	0.00	425.
1.03	4.00	104	0.00	0.00	0.00	408.
1.03	4.30	105	0.00	0.00	0.00	392.
1.03	5.00	106	0.00	0.00	0.00	376.
1.03	5.30	107	0.00	0.00	0.00	361.
1.03	6.00	108	0.00	0.00	0.00	347.
1.03	6.30	109	0.00	0.00	0.00	333.
1.03	7.00	110	0.00	0.00	0.00	320.
1.03	7.30	111	0.00	0.00	0.00	307.

1.02	2.00	52	0.06	0.01	0.05	19.	1.03	8.00	112	0.00	0.00	0.00	295.
1.02	2.30	53	0.06	0.01	0.05	25.	1.03	8.30	113	0.00	0.00	0.00	283.
1.02	3.00	54	0.06	0.01	0.05	29.	1.03	9.00	114	0.00	0.00	0.00	272.
1.02	3.30	55	0.06	0.01	0.05	32.	1.03	9.30	115	0.00	0.00	0.00	261.
1.02	4.00	56	0.06	0.01	0.05	34.	1.03	10.00	116	0.00	0.00	0.00	251.
1.02	4.30	57	0.06	0.01	0.05	35.	1.03	10.30	117	0.00	0.00	0.00	241.
1.02	5.00	58	0.06	0.01	0.05	36.	1.03	11.00	118	0.00	0.00	0.00	231.
1.02	5.30	59	0.06	0.01	0.05	37.	1.03	11.30	119	0.00	0.00	0.00	22_.
1.02	6.00	60	0.06	0.01	0.05	37.	1.03	12.00	120	0.00	0.00	0.00	213.

SUM 23.68 20.02 3.66 74885.
(601.)(509.)(93.)(2120.50)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6555.	4240.	1477.	623.	74773.
CMS	186.	120.	42.	18.	2117.
INCHES		15.39	21.38	22.55	22.55
MM		389.81	543.11	572.87	572.87
AC-FT		2102.	2929.	3090.	3090.
THOUS CU M		2593.	3613.	3811.	3811.

OVF

STATION 1

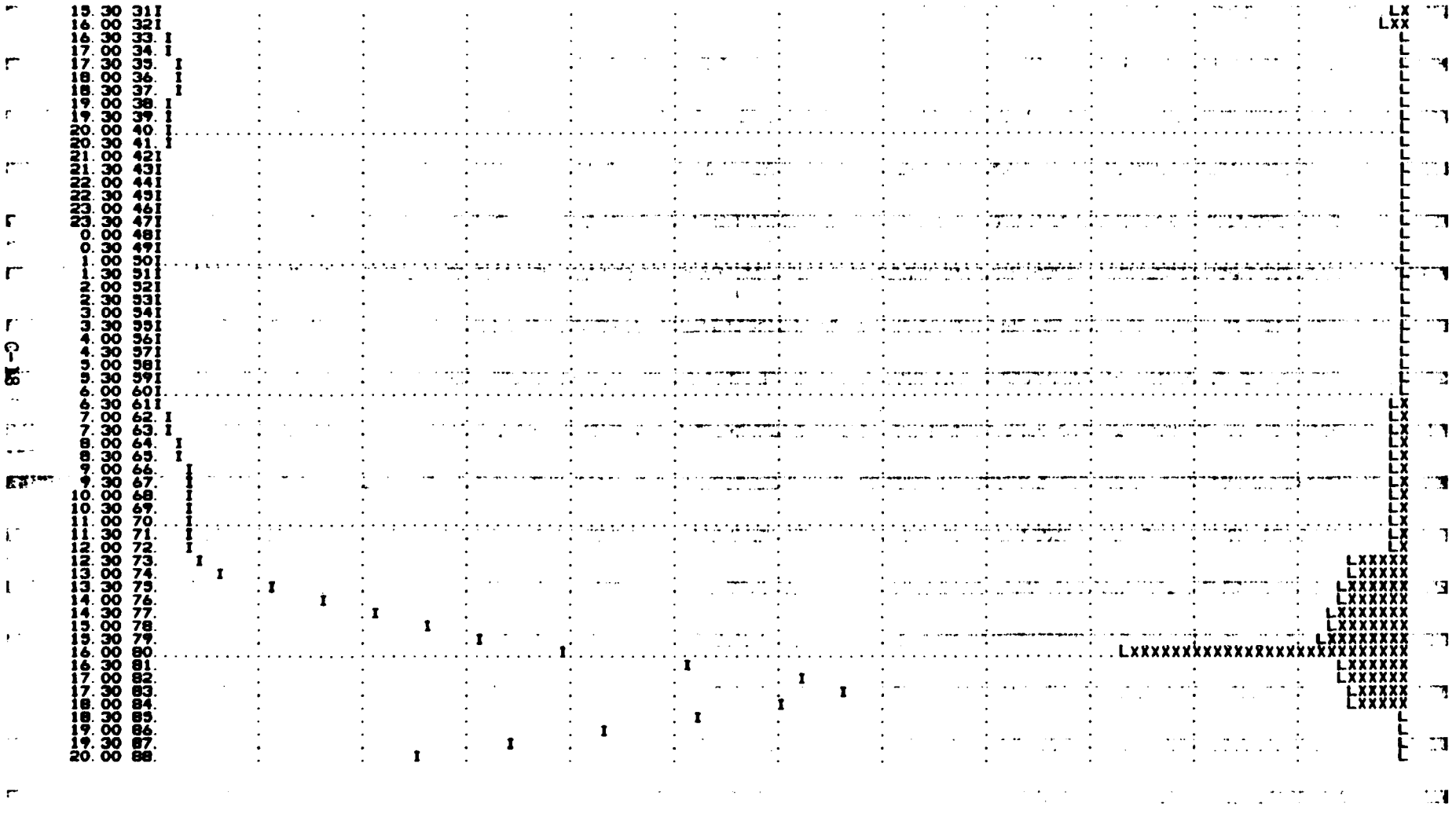
INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(W)

0. 1000. 2000. 3000. 4000. 5000. 6000. 7000. 0. 0. 0. 0. 0.

PRECIP(L) AND EXCESS(X)

0. 0. 0. 0. 0. 0. 0. 0. 0. 6. 4. 2. 0.

0.30	11	
1.00	21	
1.30	31	
2.00	41	
2.30	51	
3.00	61	
3.30	71	
4.00	81	
4.30	91	
5.00	101	
5.30	111	
6.00	121	
6.30	131	
7.00	141	
7.30	151	
8.00	161	
8.30	171	
9.00	181	
9.30	191	
10.00	201	
10.30	211	
11.00	221	
11.30	231	
12.00	241	
12.30	251	
13.00	261	
13.30	271	
14.00	281	
14.30	291	
15.00	301	


15.30 31
16.00 32
16.30 33.
17.00 34.
17.30 35.
18.00 36.
18.30 37.
19.00 38.
19.30 39.
20.00 40.
20.30 41.
21.00 42
21.30 43
22.00 44
22.30 45
23.00 46
23.30 47
0.00 48
0.30 49
1.00 50
1.30 51
2.00 52
2.30 53
3.00 54
3.30 55
4.00 56
4.30 57
5.00 58
5.30 59
6.00 60
6.30 61
7.00 62.
7.30 63.
8.00 64.
8.30 65.
9.00 66.
9.30 67.
10.00 68.
10.30 69.
11.00 70.
11.30 71.
12.00 72.
12.30 73.
13.00 74.
13.30 75.
14.00 76.
14.30 77.
15.00 78.
15.30 79.
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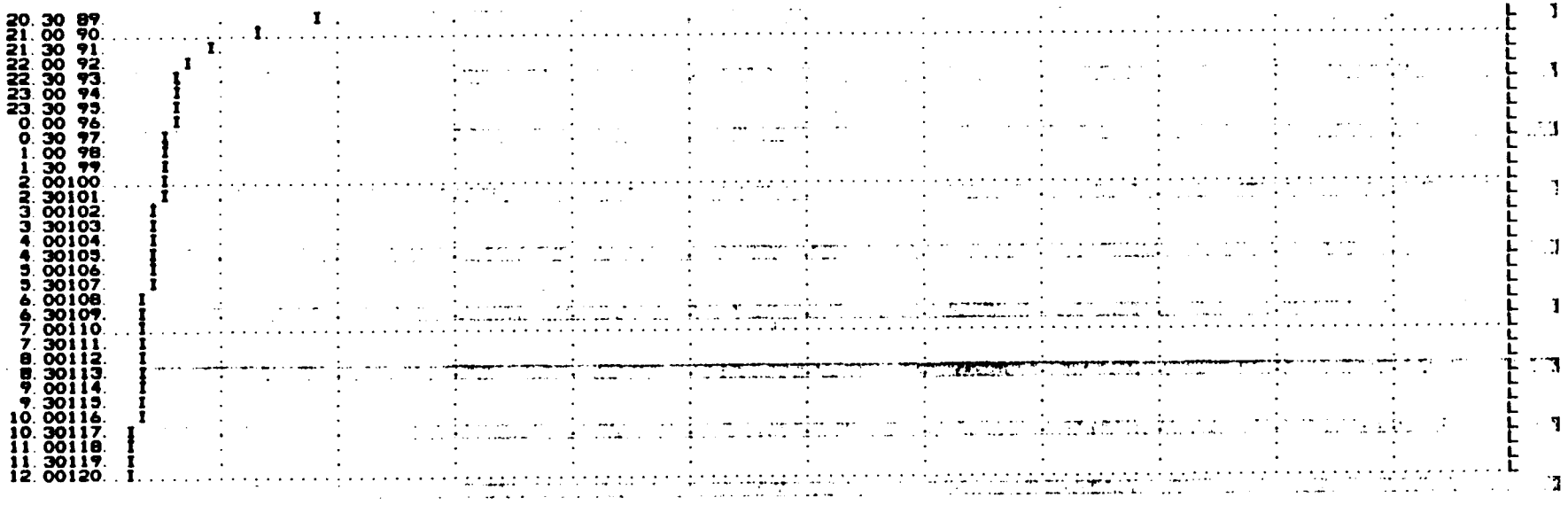
20.00 88.



DVN

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	4.	7.	9.	9.	8.	6.	5.	4.
3.	2.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	2.	2.	2.	2.	2.	2.
2.	4.	6.	9.	11.	13.	14.	15.	16.	16.
16.	17.	20.	32.	54.	81.	107.	131.	155.	195.
257.	311.	328.	302.	260.	215.	168.	124.	89.	63.
47.	35.	32.	31.	29.	28.	27.	26.	25.	24.
23.	22.	21.	20.	20.	19.	18.	17.	17.	16.
15.	15.	14.	14.	13.	13.	12.	12.	11.	11.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	328.	212.	74.	31.	3739.
CMS	9.	6.	2.	1.	106.
INCHES		0.77	1.07	1.13	1.13
MM		19.49	27.16	28.64	28.64
AC-FT		105.	146.	154.	154.
THOUS CU M		130.	181.	191.	191.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	2.	7.	12.	16.	16.	14.	11.	9.	6.
5.	3.	2.	2.	2.	1.	1.	1.	1.	1.
1.	2.	2.	3.	3.	3.	3.	3.	3.	3.
4.	7.	11.	16.	21.	24.	26.	27.	28.	29.
29.	30.	36.	58.	98.	146.	193.	236.	278.	350.
462.	561.	590.	544.	468.	388.	302.	223.	160.	117.
85.	63.	57.	55.	53.	51.	49.	47.	45.	43.
41.	40.	38.	37.	35.	34.	33.	31.	30.	29.
28.	27.	25.	24.	23.	23.	22.	21.	20.	19.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	590.	382.	133.	56.	6730.
CMS	17.	11.	4.	2.	191.
INCHES		1.38	1.92	2.03	2.03
MM		35.08	48.88	51.56	51.56
AC-FT		189.	264.	278.	278.
THOUS CU M		233.	325.	343.	343.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 3

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	2.	7.	13.	17.	17.	15.	13.	10.	7.
5.	4.	3.	2.	2.	2.	2.	1.	1.	1.
1.	2.	2.	3.	3.	3.	3.	4.	4.	4.
5.	7.	12.	18.	23.	26.	28.	30.	31.	32.
33.	33.	40.	65.	109.	162.	214.	263.	309.	389.
513.	623.	656.	604.	520.	431.	336.	248.	178.	129.
95.	71.	64.	61.	59.	56.	54.	52.	50.	48.
46.	44.	42.	41.	39.	38.	36.	35.	33.	32.
31.	29.	28.	27.	26.	25.	24.	23.	22.	21.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	656.	424.	148.	62.	7477.
CMS	19.	12.	4.	2.	212.
INCHES		1.53	2.14	2.26	2.26
MM		38.98	54.31	57.29	57.29
AC-FT		210.	293.	309.	309.
THOUS CU M		259.	361.	381.	381.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 4

1.	1.	1.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	3.	8.	15.	19.	19.	17.	14.	11.	8.
6.	4.	3.	2.	2.	2.	2.	2.	2.	2.
1.	2.	3.	3.	3.	4.	4.	4.	4.	4.
5.	8.	14.	20.	25.	29.	31.	33.	34.	35.
36.	36.	44.	71.	120.	179.	236.	289.	340.	428.
565.	685.	721.	665.	572.	474.	370.	272.	196.	142.

104.	78.	70.	67.	63.	62.	60.	57.	55.	53.
51.	49.	47.	45.	43.	41.	40.	38.	37.	35.
34.	32.	31.	30.	29.	28.	26.	25.	24.	23.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	721.	466.	162.	69.	8225.
CMS	20.	13.	5.	2.	233.
INCHES		1.69	2.35	2.48	2.48
MM		42.88	59.74	63.02	63.02
AC-FT		231.	322.	340.	340.
THOUS CU M		285.	397.	419.	419.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 5

1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
1.	3.	9.	16.	21.	21.	18.	15.	12.	9.
6.	4.	3.	2.	2.	2.	2.	2.	2.	2.
2.	2.	3.	3.	4.	4.	4.	4.	4.	4.
5.	9.	19.	22.	27.	31.	34.	36.	38.	38.
39.	40.	48.	78.	130.	195.	257.	315.	371.	417.
616.	748.	787.	729.	624.	517.	403.	297.	214.	155.
114.	85.	76.	73.	70.	68.	65.	62.	60.	58.
93.	93.	91.	49.	47.	45.	43.	42.	40.	38.
37.	35.	34.	33.	31.	30.	29.	28.	27.	26.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	787.	509.	177.	75.	8973.
CMS	22.	14.	5.	2.	254.
INCHES		1.84	2.57	2.71	2.71
MM		46.78	65.17	68.74	68.74
AC-FT		298.	358.	371.	371.
THOUS CU M		311.	434.	457.	457.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 6

1.	1.	1.	1.	1.	1.	1.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	3.	10.	18.	22.	23.	20.	16.	13.	9.
7.	5.	3.	2.	2.	2.	2.	2.	2.	2.
2.	2.	3.	4.	4.	5.	5.	5.	5.	5.
6.	10.	16.	24.	30.	34.	37.	39.	41.	42.
42.	43.	52.	84.	141.	211.	279.	341.	402.	506.
667.	810.	852.	786.	676.	560.	437.	322.	232.	168.
123.	92.	83.	80.	76.	73.	70.	68.	65.	62.
60.	57.	55.	53.	51.	49.	47.	45.	43.	42.
40.	38.	37.	35.	34.	33.	31.	30.	29.	28.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	852.	551.	192.	81.	9720.
CMS	24.	16.	5.	2.	275.
INCHES		2.00	2.78	2.93	2.93
MM		50.68	70.60	74.47	74.47
AC-FT		273.	381.	402.	402.
THOUS CU M		337.	470.	495.	495.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 7

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	0.	0.	1.	1.	1.	1.	1.
1.	5.	15.	27.	35.	35.	31.	25.	20.	14.
10.	7.	5.	4.	3.	3.	3.	3.	3.	3.
3.	4.	5.	6.	6.	7.	7.	7.	7.	7.
9.	15.	25.	36.	46.	52.	57.	60.	63.	64.
65.	66.	80.	130.	217.	325.	429.	525.	619.	778.
1027.	1246.	1311.	1209.	1040.	861.	672.	495.	357.	259.
190.	141.	127.	122.	117.	113.	108.	104.	100.	96.
92.	88.	85.	82.	78.	75.	72.	69.	67.	64.
61.	59.	57.	54.	52.	50.	48.	46.	44.	43.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1311.	848.	295.	125.	14955.
CMS	37.	24.	8.	4.	423.
INCHES		3.07	4.28	4.51	4.51
MM		77.96	108.62	114.57	114.57
AC-FT		420.	586.	618.	618.
THOUS CU M		519.	723.	762.	762.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 8

2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	2.	2.	2.	2.
2.	12.	37.	67.	87.	87.	76.	63.	49.	36.
25.	18.	13.	9.	8.	8.	8.	7.	7.	7.
7.	10.	12.	14.	16.	17.	17.	18.	18.	19.
23.	37.	62.	91.	114.	131.	142.	151.	156.	160.
163.	169.	201.	324.	543.	812.	1072.	1313.	1547.	1946.
2567.	3115.	3278.	3022.	2600.	2154.	1680.	1238.	891.	647.
474.	353.	319.	306.	294.	282.	271.	260.	250.	240.
230.	221.	212.	204.	196.	188.	181.	173.	166.	160.
194.	147.	142.	136.	131.	125.	120.	116.	111.	107.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3278.	2120.	738.	312.	37386.
CMS	93.	60.	21.	9.	1059.
INCHES		7.67	10.69	11.28	11.28
MM		194.91	271.55	286.43	286.43
AC-FT		1051.	1465.	1545.	1545.
THOUS CU M		1297.	1807.	1906.	1906.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 9

3.	3.	3.	4.	4.	4.	4.	4.	4.	4.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	2.	2.	3.	3.	4.	4.	4.
5.	23.	74.	135.	173.	173.	153.	126.	98.	71.
30.	36.	26.	18.	17.	16.	15.	15.	14.	14.
13.	19.	25.	29.	32.	34.	35.	36.	37.	37.
46.	79.	125.	182.	229.	262.	289.	301.	313.	321.
326.	330.	402.	649.	1087.	1624.	2145.	2625.	3094.	3891.
5134.	6230.	6333.	6043.	5200.	4307.	3360.	2476.	1783.	1295.
949.	706.	637.	612.	587.	564.	542.	520.	499.	480.

461. 442. 425. 408. 392. 376. 361. 347. 333. 320.
307. 295. 283. 272. 261. 251. 241. 231. 222. 213.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6555.	4240.	1477.	623.	74773.
CMS	186.	120.	42.	18.	2117.
INCHES		15.35	21.38	22.55	22.55
MM		389.81	543.10	572.87	572.87
AC-FT		2102.	2929.	3090.	3090.
THOUS CU M		2593.	3613.	3811.	3811.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

TENNANAH LAKE ROUTING - MODIFIED PULS METHOD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	0	0	1	0	0

ROUTING DATA

GLOSS	CLOSS	AVQ	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	-1

STAGE	1956.00	1957.30	1963.20	1963.70	1964.70	1965.70	1966.70	1967.70	1968.70	1969.70
	1970.70	1971.70	1972.70	1973.70	1974.70	1975.70				
FLOW	0.00	35.00	60.00	83.00	115.00	142.00	165.00	185.00	200.00	220.00
	240.00	250.00	270.00	280.00	300.00	305.00				
SURFACE AREA=	156.	184.	293.							
CAPACITY=	0.	679.	3406.							
ELEVATION=	1956.	1960.	1980.							

CREL	SPWID	COGW	EXPW	ELEVL	COGL	CAREA	EXPL
1956.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COGD	EXPD	DAMWID
1972.8	2.5	1.5	100.

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

				OUTFLOW					
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

```
        0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
        0.      0.      1.      1.      1.      1.      1.      1.      2.      2.
        3.      4.      4.      5.      6.      7.      7.      7.      8.      8.
        8.      8.      8.      8.      8.      8.      8.      8.      8.      8.
        8.      8.      8.      9.      9.      9.      9.      9.      9.      9.
        9.      9.      9.      9.      9.      9.      9.      9.      9.      9.

                                     STORAGE
        0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
        0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
        0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
        0.      0.      0.      0.      1.      1.      1.      1.      2.      2.
        2.      2.      2.      2.      2.      2.      2.      2.      2.      2.
        2.      2.      2.      2.      2.      2.      2.      2.      2.      2.
        2.      3.      3.      3.      3.      4.      4.      5.      6.      6.
        7.      8.      8.      9.     11.     14.     18.     23.     28.     35.
       45.     56.     69.     82.     93.    103.    111.    116.    120.    123.
      125.    127.    128.    129.    129.    130.    131.    132.    132.    133.
      134.    134.    135.    135.    136.    136.    136.    137.    137.    137.
      138.    138.    138.    138.    139.    139.    139.    139.    139.    139.

                                      STAGE
   1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
   1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
   1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
   1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
   1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
   1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
   1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
   1956.0  1956.0  1956.1  1956.1  1956.1  1956.1  1956.1  1956.1  1956.2  1956.2
   1956.3  1956.4  1956.4  1956.5  1956.6  1956.7  1956.7  1956.7  1956.8  1956.8
   1956.8  1956.8  1956.8  1956.8  1956.8  1956.8  1956.8  1956.8  1956.8  1956.8
   1956.8  1956.8  1956.8  1956.9  1956.9  1956.9  1956.9  1956.9  1956.9  1956.9
   1956.9  1956.9  1956.9  1956.9  1956.9  1956.9  1956.9  1956.9  1956.9  1956.9

PEAK OUTFLOW IS        9.  AT TIME  60.00 HOURS

                       PEAK    6-HOUR    24-HOUR    72-HOUR   TOTAL VOLUME
             CFS         9.        9.         7.         3.           324.
             CMS         0.        0.         0.         0.             9.
          INCHES                 0.03       0.10       0.10           0.10
              MM                 0.80       2.43       2.48           2.48
           AC-FT                   4.        13.        13.            13.
      THOUS CU M                   5.        16.        17.            17.

*OVF*                               STATION     1

                        INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
           0.      40.      80.     120.     160.     200.     240.     280.     320.     360.      0.      0.      0.
  0.30    1I
  1.00    2I
  1.30    3I
  2.00    4I
  2.30    5I
  3.00    6I
  3.30    7I
  4.00    8I
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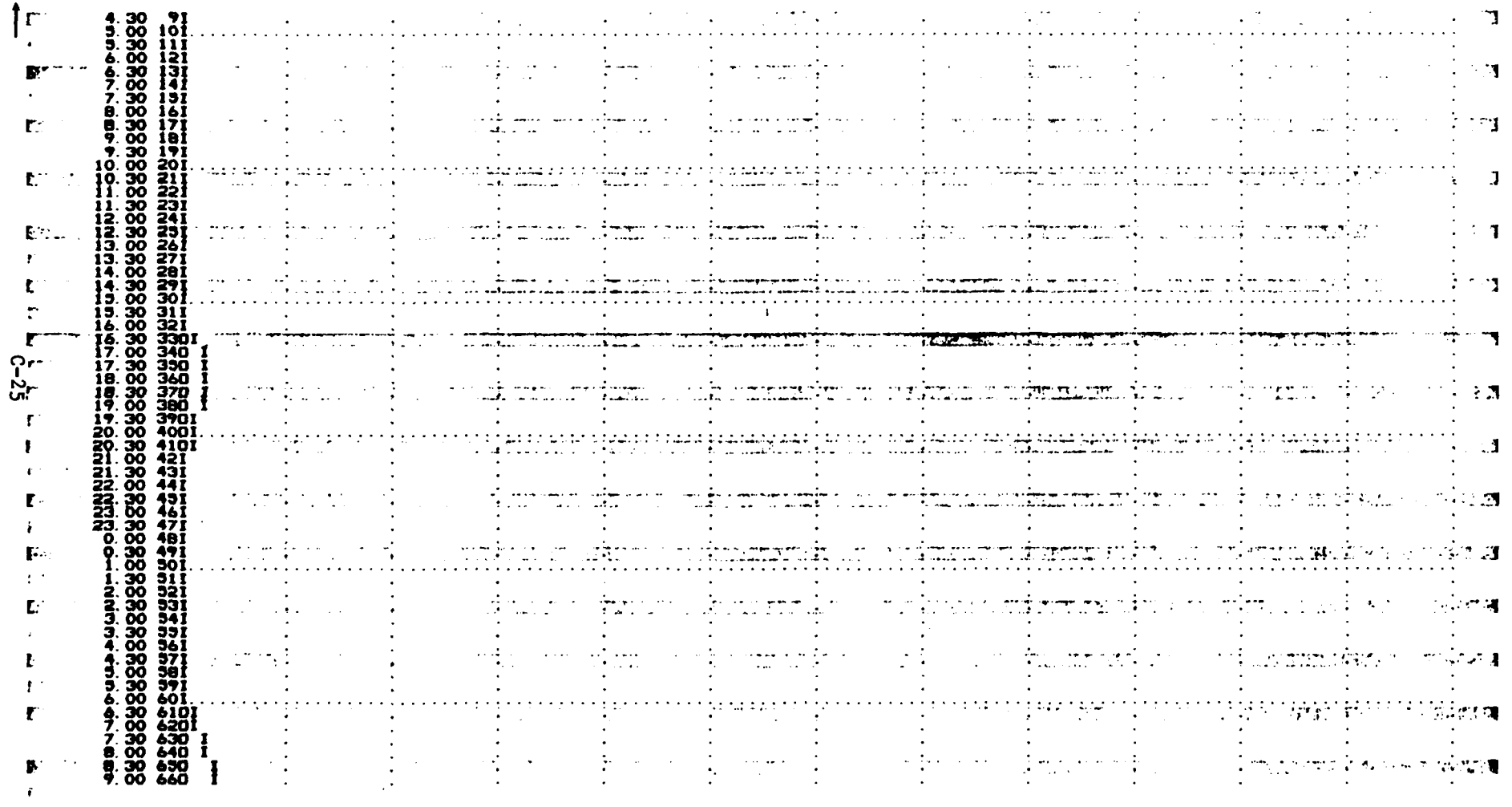
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9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 330
17.00 340
17.30 350
18.00 360
18.30 370
19.00 380
19.30 390
20.00 400
20.30 410
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
9.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
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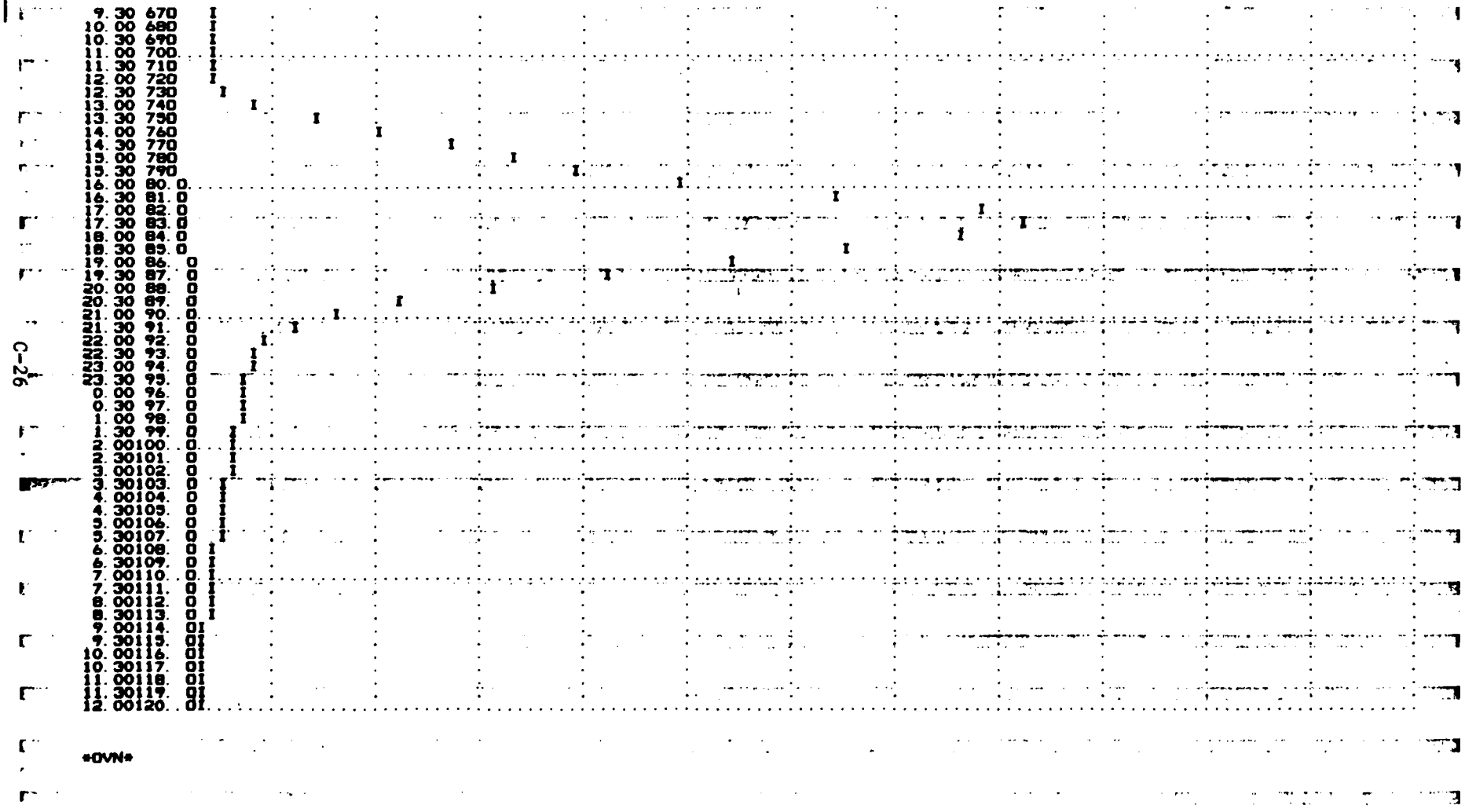
7.00 620
7.30 630
8.00 640
8.30 650
9.00 660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10.30 690
11.00 700
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12.30 730
13.00 740
13.30 750
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14.30 770
15.00 780
15.30 790
16.00 80.0
16.30 81.0
17.00 82.0
17.30 83.0
18.00 84.0
18.30 85.0
19.00 86. 0
19.30 87. 0
20.00 88. 0
20.30 89. 0
21.00 90. 0
21.30 91. 0
22.00 92. 0
22.30 93. 0
23.00 94. 0
23.30 95. 0
0.00 96. 0
0.30 97. 0
1.00 98. 0
1.30 99. 0
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3.00102. 0
3.30103. 0
4.00104. 0
4.30105. 0
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7.30111. 0
8.00112. 0
8.30113. 0
9.00114. 0
9.30115. 0
10.00116. 0
10.30117. 0
11.00118. 0
11.30119. 0
12.00120. 0

OVN

STATION 1, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	3.	3.	4.
5.	6.	8.	9.	11.	12.	12.	13.	14.	14.
14.	14.	14.	14.	15.	15.	15.	15.	15.	15.
15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
15.	15.	16.	16.	16.	16.	16.	16.	16.	16.

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	2.	2.	3.	3.	3.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	5.	5.	5.	5.
5.	5.	6.	6.	7.	8.	9.	10.	11.	12.
13.	14.	16.	17.	21.	26.	32.	41.	52.	64.
81.	102.	125.	148.	169.	186.	200.	210.	217.	223.
226.	229.	230.	232.	234.	235.	237.	238.	239.	240.
242.	243.	244.	244.	245.	246.	247.	247.	248.	249.
249.	250.	250.	250.	251.	251.	251.	251.	252.	252.

STAGE

1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.1	1956.1	1956.1	1956.1
1956.1	1956.1	1956.1	1956.1	1956.1	1956.2	1956.2	1956.3	1956.3	1956.4
1956.5	1956.6	1956.8	1956.9	1957.1	1957.2	1957.2	1957.3	1957.4	1957.4
1957.4	1957.4	1957.4	1957.4	1957.5	1957.5	1957.5	1957.5	1957.5	1957.5
1957.5	1957.5	1957.5	1957.5	1957.5	1957.5	1957.5	1957.5	1957.5	1957.5
1957.5	1957.5	1957.6	1957.6	1957.6	1957.6	1957.6	1957.6	1957.6	1957.6

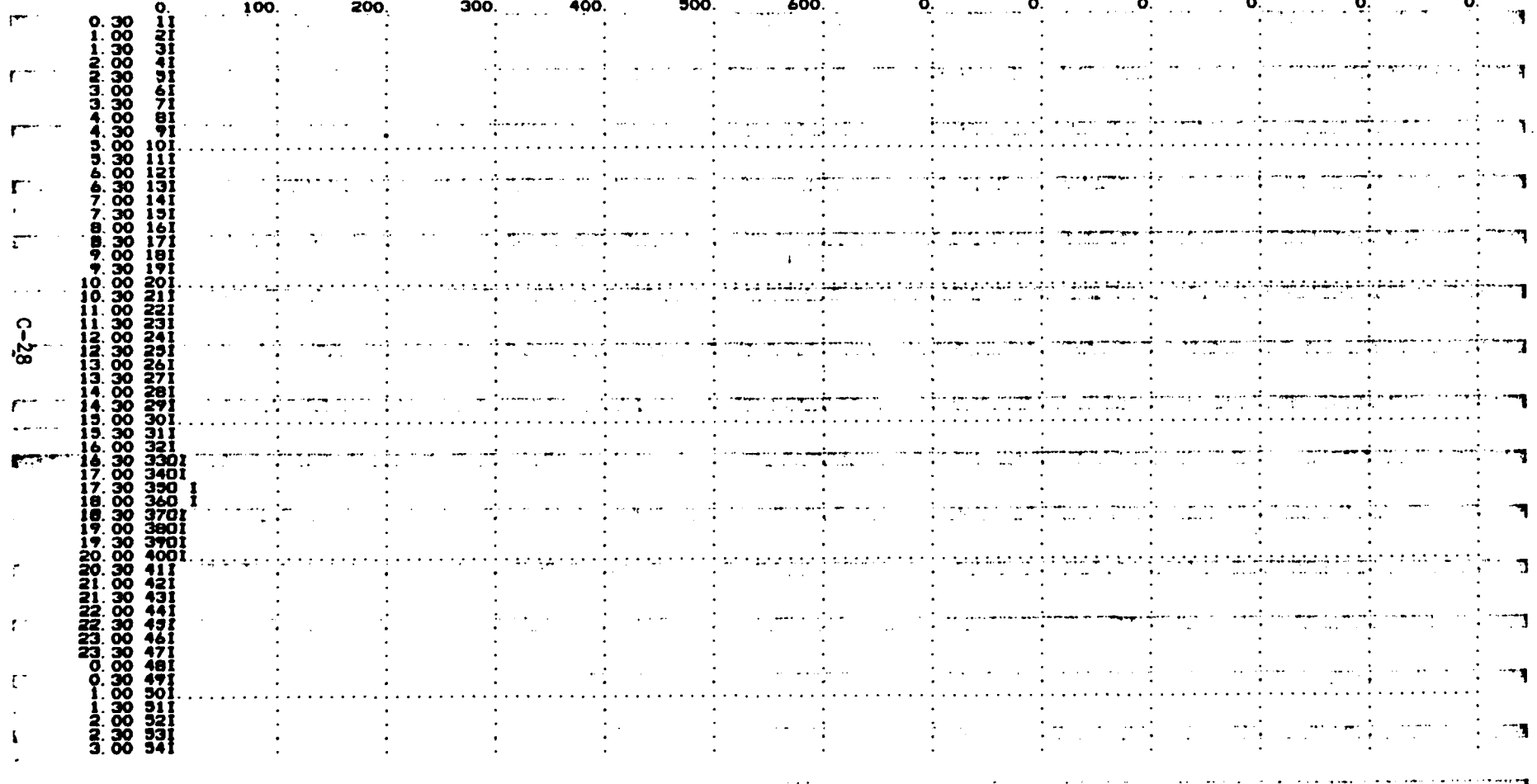
PEAK OUTFLOW IS 16. AT TIME 60.00 HOURS

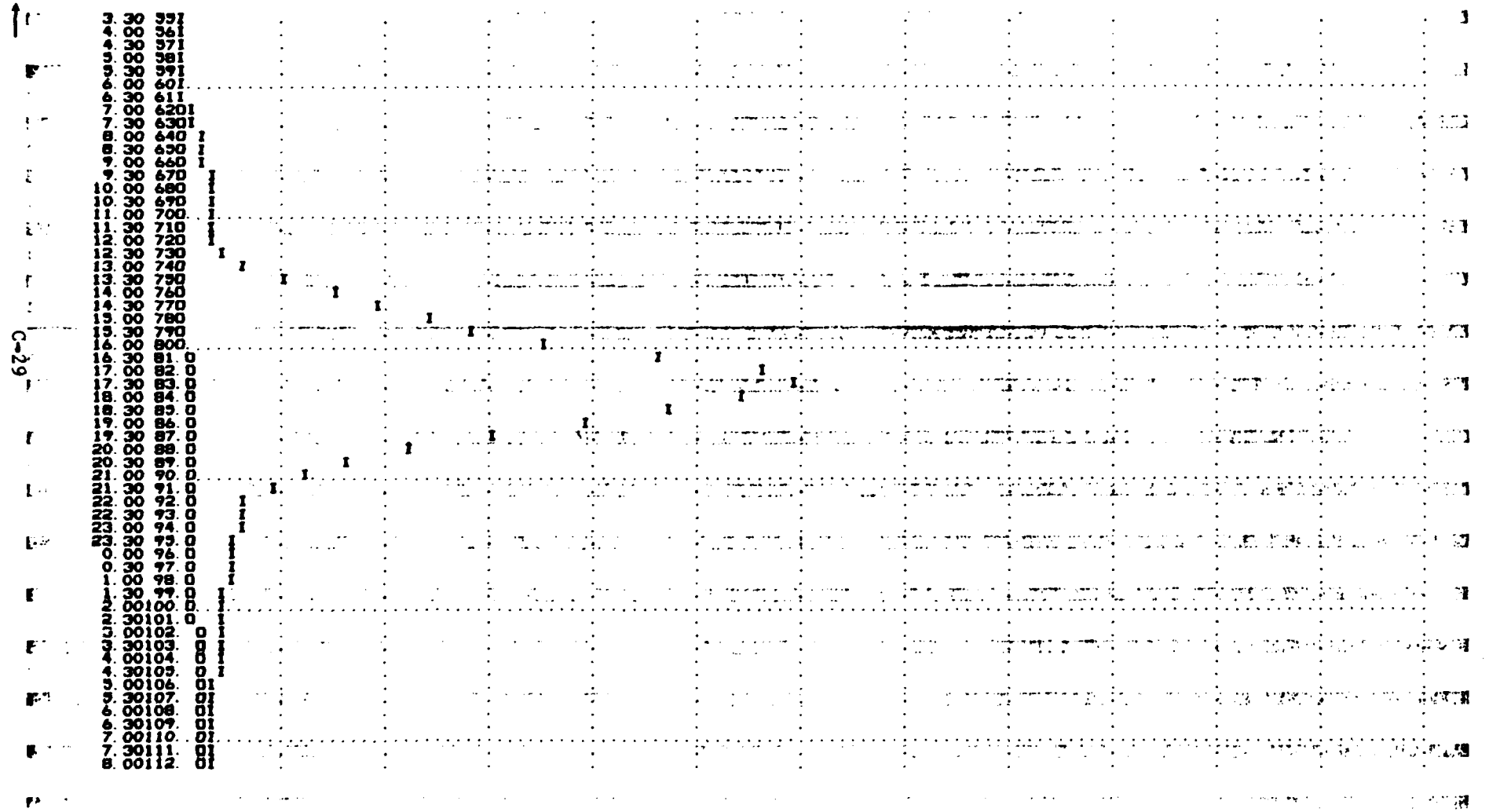
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	16.	16.	12.	5.	579.
CMS	0.	0.	0.	0.	16.
INCHES		0.06	0.17	0.17	0.17
MM		1.43	4.34	4.44	4.44
AC-FT		8.	23.	24.	24.
THOUS CU M		9.	29.	30.	30.

OVF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

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4.00 561
4.30 571
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11.00 700
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12.30 730
13.00 740
13.30 750
14.00 760
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18.00 84.0
18.30 85.0
19.00 86.0
19.30 87.0
20.00 88.0
20.30 89.0
21.00 90.0
21.30 91.0
22.00 92.0
22.30 93.0
23.00 94.0
23.30 95.0
0.00 96.0
0.30 97.0
1.00 98.0
1.30 99.0
2.00100.0
2.30101.0
3.00102.0
3.30103.0
4.00104.0
4.30105.0
5.00106.01
5.30107.01
6.00108.01
6.30109.01
7.00110.01
7.30111.01
8.00112.01

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 8.30113.  OI
 9.00114.  I
 9.30115.  I
10.00116.  I
10.30117.  I
11.00118.  I
11.30119.  I
12.00120.  I
```

DVN

STATION 1, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	3.	4.	5.
6.	7.	9.	10.	12.	13.	14.	15.	15.	15.
16.	16.	16.	16.	16.	16.	16.	16.	16.	17.
17.	17.	17.	17.	17.	17.	17.	17.	17.	17.
17.	17.	17.	17.	17.	17.	17.	17.	17.	17.

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	2.	3.	3.	4.	4.
4.	4.	4.	4.	4.	4.	5.	5.	5.	5.
5.	5.	5.	5.	5.	5.	5.	5.	5.	6.
6.	6.	6.	7.	8.	9.	10.	11.	12.	13.
15.	16.	17.	19.	23.	29.	36.	46.	58.	72.
90.	113.	139.	165.	188.	207.	222.	234.	242.	248.
252.	254.	256.	258.	260.	262.	263.	265.	266.	268.
269.	270.	271.	272.	273.	274.	275.	275.	276.	277.
277.	278.	278.	279.	279.	279.	280.	280.	280.	280.

STAGE

1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.1	1956.1	1956.1	1956.1	1956.1
1956.1	1956.1	1956.1	1956.1	1956.1	1956.2	1956.2	1956.3	1956.4	1956.5
1956.6	1956.7	1956.9	1957.0	1957.2	1957.3	1957.4	1957.5	1957.5	1957.5
1957.6	1957.6	1957.6	1957.6	1957.6	1957.6	1957.6	1957.6	1957.6	1957.7
1957.7	1957.7	1957.7	1957.7	1957.7	1957.7	1957.7	1957.7	1957.7	1957.7
1957.7	1957.7	1957.7	1957.7	1957.7	1957.7	1957.7	1957.7	1957.7	1957.7

PEAK OUTFLOW IS 17. AT TIME 60.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	17.	17.	13.	9.	643.
CMS	0.	0.	0.	0.	18.
INCHES		0.06	0.19	0.19	0.19
MM		1.58	4.82	4.93	4.93
AC-FT		9.	26.	27.	27.
THOUS CU M		11.	32.	33.	33.

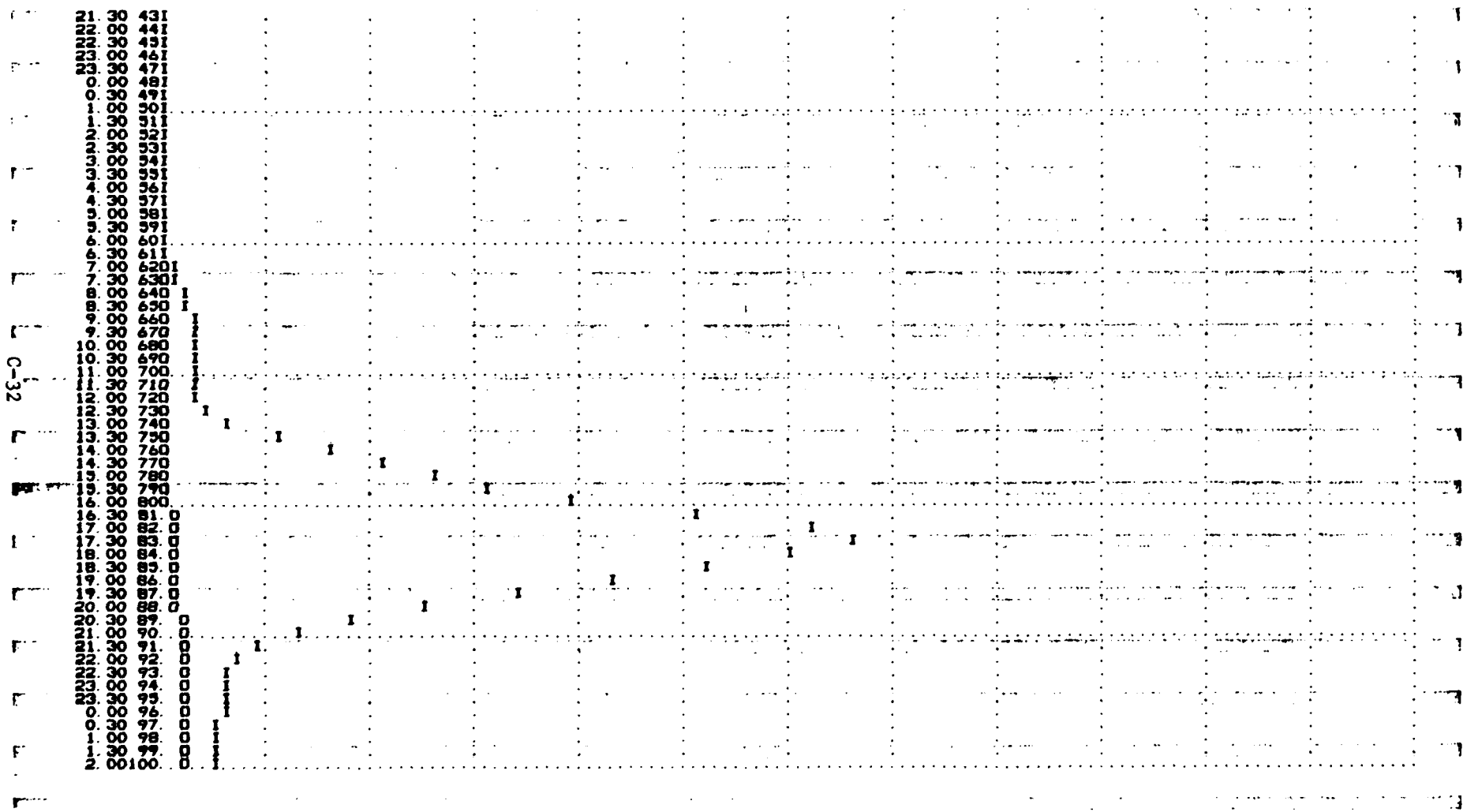
OVF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

0. 100. 200. 300. 400. 500. 600. 700. 0. 0. 0. 0. 0.

0.30 11
1.00 21
1.30 31
2.00 41
2.30 51
3.00 61
3.30 71
4.00 81
4.30 91
5.00 101
5.30 111
6.00 121
6.30 131
7.00 141
7.30 151
8.00 161
8.30 171
9.00 181
9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 330I
17.00 340I
17.30 350 I
18.00 360 I
18.30 370 I
19.00 380I
19.30 390I
20.00 400I
20.30 410I
21.00 421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23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 6201
7.30 6301
8.00 640
8.30 650
9.00 660
9.30 670
10.00 680
10.30 690
11.00 700
11.30 710
12.00 720
12.30 730
13.00 740
13.30 750
14.00 760
14.30 770
15.00 780
15.30 790
16.00 800
16.30 81.0
17.00 82.0
17.30 83.0
18.00 84.0
18.30 85.0
19.00 86.0
19.30 87.0
20.00 88.0
20.30 89.0
21.00 90.0
21.30 91.0
22.00 92.0
22.30 93.0
23.00 94.0
23.30 95.0
0.00 96.0
0.30 97.0
1.00 98.0
1.30 99.0
2.00100.0

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 2 30101  0  I
 3 00102  0  I
 3 30103  0  I
 4 00104  0  I
 4 30105  0  I
 5 00106  0  I
 5 30107  0  I
 6 00108  0I
 6 30109  0I
 7 00110  0I
 7 30111  0I
 8 00112  0I
 8 30113  0I
 9 00114  0I
 9 30115  0I
10 00116  0I
10 30117  I
11 00118  I
11 30119  I
12 00120  I
```

OVRD

STATION 1, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	2.	2.	3.	3.	4.	5.
6.	8.	10.	11.	13.	14.	15.	16.	16.	17.
17.	17.	17.	18.	18.	18.	18.	18.	18.	18.
18.	18.	18.	18.	18.	19.	19.	19.	19.	19.
19.	19.	19.	19.	19.	19.	19.	19.	19.	19.

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	2.	3.	3.	4.	4.
5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
5.	5.	5.	5.	5.	6.	6.	6.	6.	6.
6.	6.	7.	7.	8.	9.	11.	12.	13.	15.
16.	17.	19.	21.	25.	31.	40.	50.	63.	79.
99.	125.	153.	182.	207.	228.	244.	257.	266.	272.
277.	280.	282.	284.	286.	288.	290.	291.	293.	294.
296.	297.	298.	299.	300.	301.	302.	303.	304.	304.
305.	306.	306.	306.	307.	307.	308.	308.	308.	308.

STAGE

1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1
1956.1	1956.1	1956.1	1956.1	1956.2	1956.2	1956.3	1956.3	1956.4	1956.5
1956.6	1956.8	1957.0	1957.1	1957.3	1957.4	1957.5	1957.6	1957.6	1957.7
1957.7	1957.7	1957.7	1957.8	1957.8	1957.8	1957.8	1957.8	1957.8	1957.8
1957.8	1957.8	1957.8	1957.8	1957.8	1957.9	1957.9	1957.9	1957.9	1957.9
1957.9	1957.9	1957.9	1957.9	1957.9	1957.9	1957.9	1957.9	1957.9	1957.9

PEAK OUTFLOW IS 19. AT TIME 60.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	19.	19.	14.	6.	705.
CMS	1.	1.	0.	0.	20.
INCHES		0.07	0.21	0.21	0.21
MM		1.73	5.28	5.40	5.40
AC-FT		9.	28.	29.	29.
THOUS CU M		12.	35.	36.	36.

OVF

STATION I

```
                         INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
         0.      100.      200.      300.      400.      500.      600.      700.      800.      0.      0.      0.      0.
 0.30   1I
 1.00   2I
 1.30   3I
 2.00   4I
 2.30   5I
 3.00   6I
 3.30   7I
 4.00   8I
 4.30   9I
 5.00  10I.......................................................................................
 5.30  11I
 6.00  12I
 6.30  13I
 7.00  14I
 7.30  15I
 8.00  16I
 8.30  17I
 9.00  18I
 9.30  19I
10.00  20I.......................................................................................
10.30  21I
11.00  22I
11.30  23I
12.00  24I
12.30  25I
13.00  26I
13.30  27I
14.00  28I
14.30  29I
15.00  30I.......................................................................................
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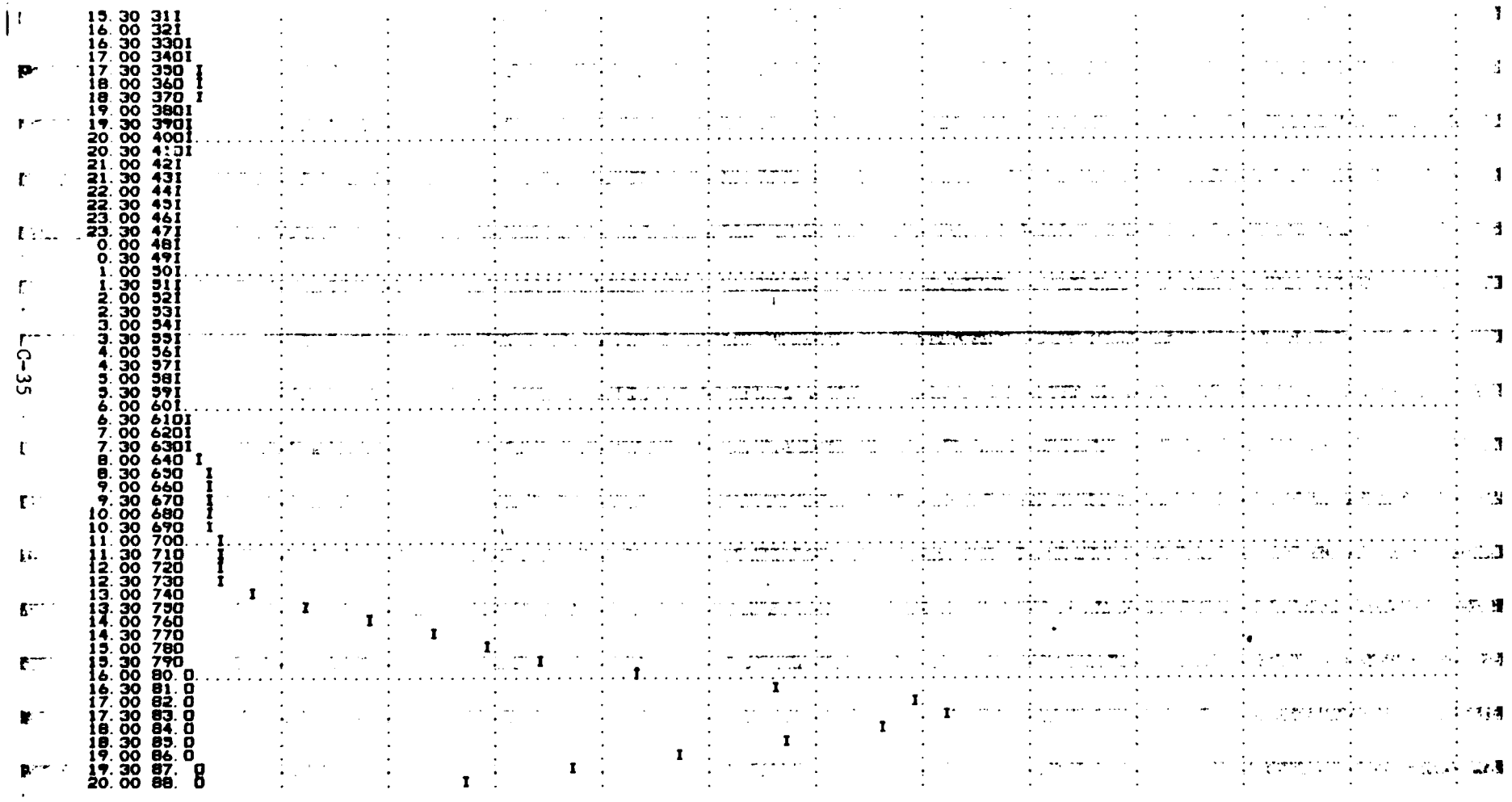
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16.00 321
16.30 3301
17.00 3401
17.30 350
18.00 360
18.30 370
19.00 3801
19.30 3901
20.00 4001
20.30 4101
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 6101
7.00 6201
7.30 6301
8.00 640
8.30 650
9.00 660
9.30 670
10.00 680
10.30 690
11.00 700
11.30 710
12.00 720
12.30 730
13.00 740
13.30 750
14.00 760
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15.00 780
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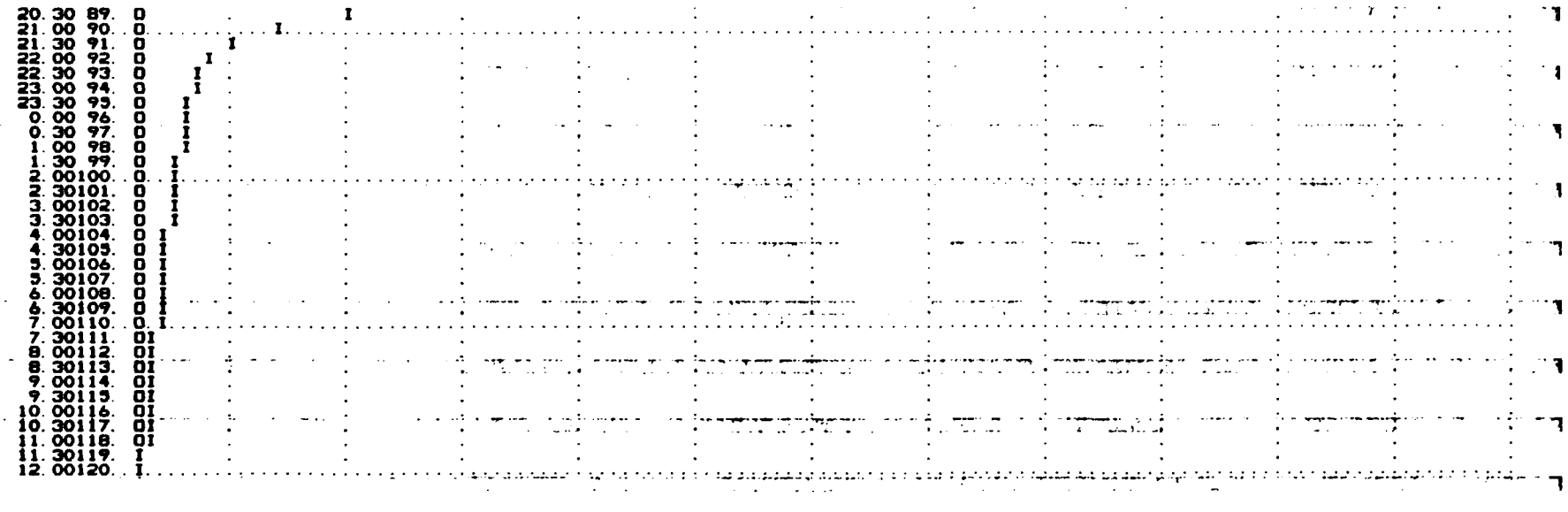

OVN

STATION 1, PLAN 1, RATIO 5

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	2.	2.	2.	3.	4.	4.	5.
7.	9.	10.	12.	14.	15.	17.	17.	18.	18.
19.	19.	19.	19.	19.	19.	19.	20.	20.	20.
20.	20.	20.	20.	20.	20.	20.	20.	20.	20.
20.	20.	21.	21.	21.	21.	21.	21.	21.	21.

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	2.	3.	4.	4.	5.
5.	5.	5.	5.	5.	5.	5.	5.	6.	6.
6.	6.	6.	6.	6.	6.	6.	6.	7.	7.
7.	7.	8.	8.	9.	10.	12.	13.	15.	16.
18.	19.	21.	24.	28.	34.	44.	55.	69.	86.
108.	136.	167.	198.	226.	248.	267.	281.	290.	297.
302.	305.	308.	310.	312.	314.	316.	318.	320.	321.
323.	324.	325.	327.	328.	329.	330.	331.	331.	332.
333.	334.	334.	335.	335.	335.	336.	336.	336.	337.

STAGE

1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1
1956.1	1956.1	1956.1	1956.2	1956.2	1956.2	1956.3	1956.4	1956.4	1956.5
1956.7	1956.9	1957.0	1957.2	1957.4	1957.5	1957.7	1957.7	1957.8	1957.8
1957.9	1957.9	1957.9	1957.9	1957.9	1957.9	1957.9	1958.0	1958.0	1958.0
1958.0	1958.0	1958.0	1958.0	1958.0	1958.0	1958.0	1958.0	1958.0	1958.0
1958.0	1958.0	1958.1	1958.1	1958.1	1958.1	1958.1	1958.1	1958.1	1958.1

PEAK OUTFLOW IS 21. AT TIME 60.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	21.	21.	16.	6.	767.
CMS	1.	1.	0.	0.	22.
INCHES		0.07	0.23	0.23	0.23
MM		1.89	5.75	5.88	5.88
AC-FT		10.	31.	32.	32.
THOUS CU M		13.	38.	39.	39.

```
*OVF*                                    STATION     1

                        INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
            0.      100.      200.      300.      400.      500.      600.      700.      800.      0.       0.       0.       0.
  0.30    1I
  1.00    2I
  1.30    3I
  2.00    4I
  2.30    5I
  3.00    6I
  3.30    7I
  4.00    8I
  4.30    9I
  5.00   10I...............................................................................................
  5.30   11I
  6.00   12I
  6.30   13I
  7.00   14I
  7.30   15I
  8.00   16I
  8.30   17I
  9.00   18I
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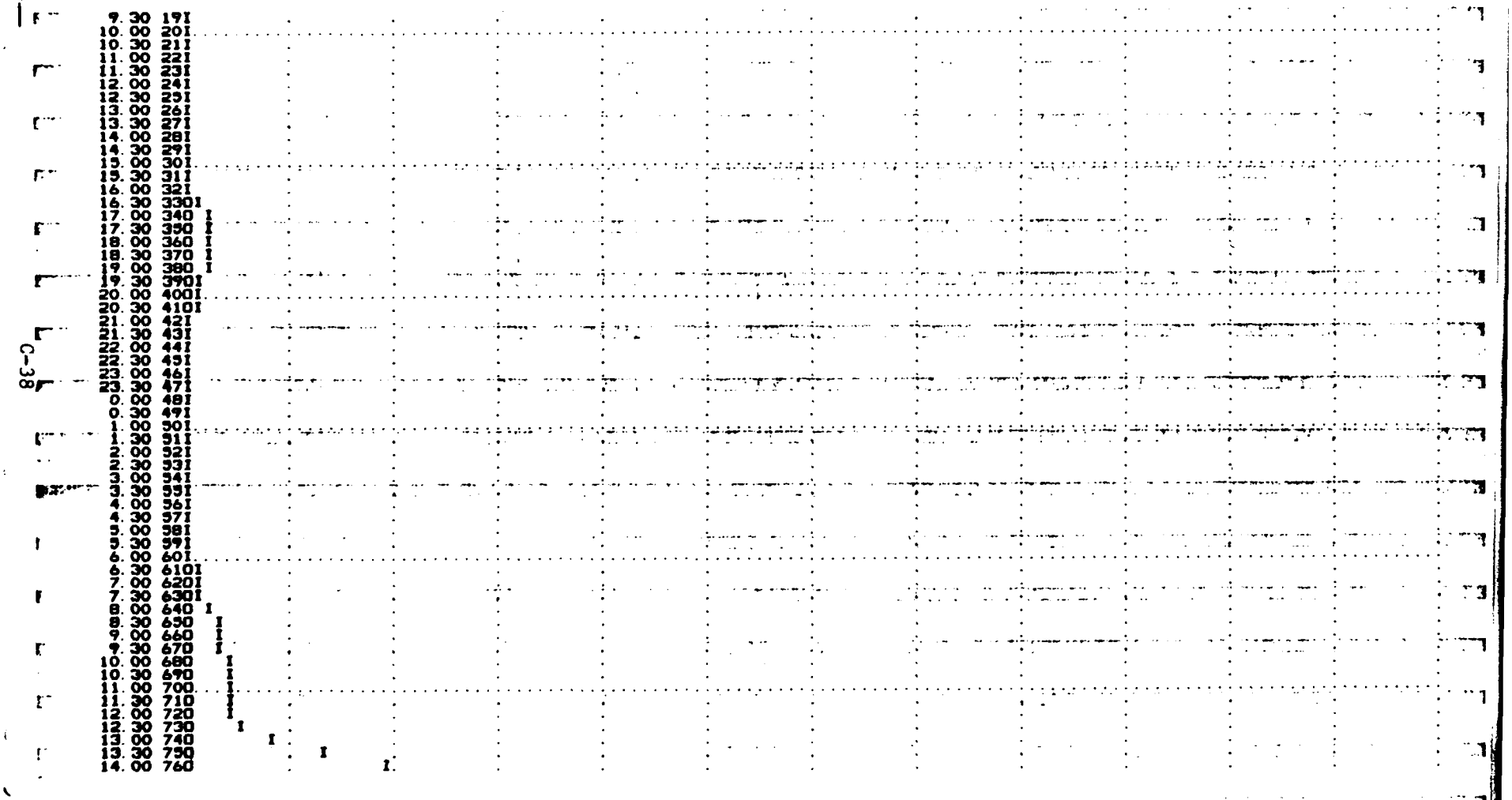
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14.30 291
15.00 301
15.30 311
16.00 321
16.30 3301
17.00 340 I
17.30 350 I
18.00 360 I
18.30 370 I
19.00 380 I
19.30 3901
20.00 4001
20.30 4101
21.00 421I
21.30 431I
22.00 441I
22.30 451I
23.00 461I
23.30 471I
0.00 481I
0.30 491I
1.00 501I
1.30 511I
2.00 521I
2.30 531I
3.00 541I
3.30 551I
4.00 561I
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6.00 601I
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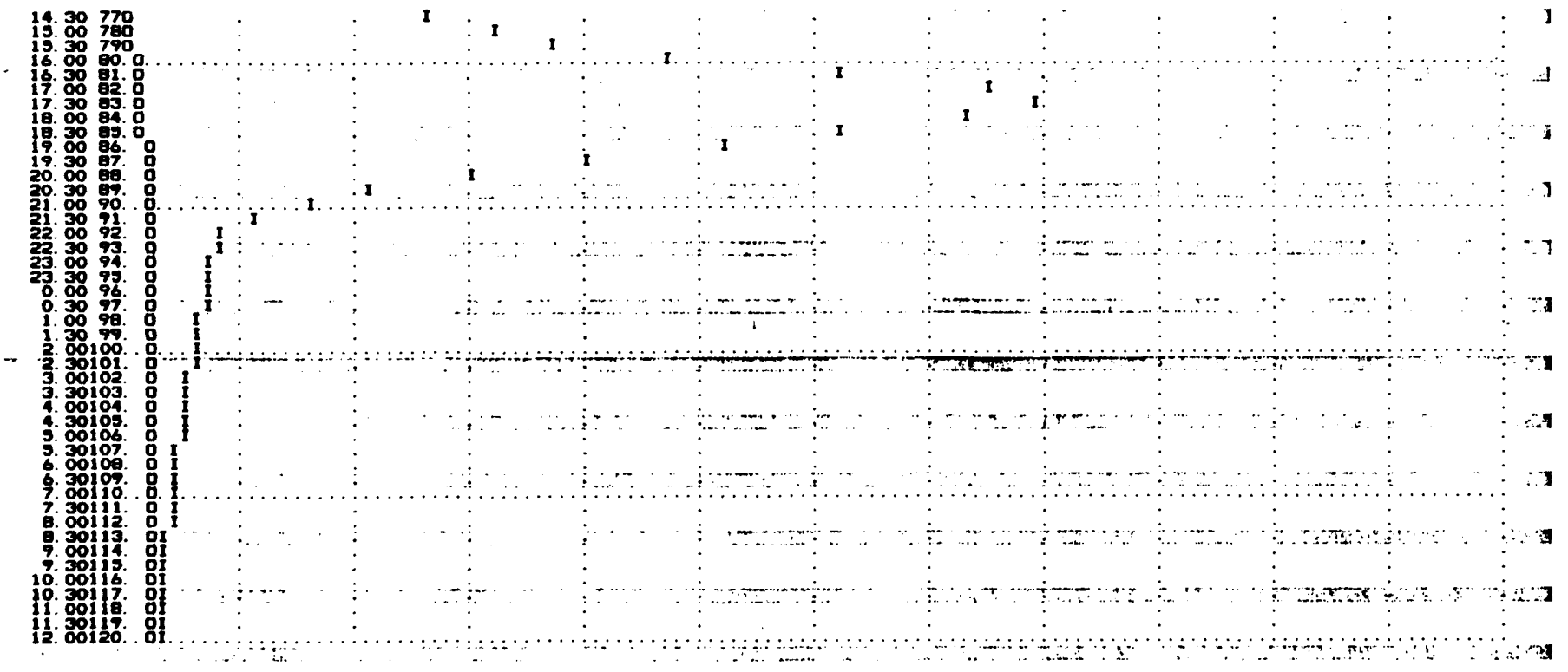

OVN

STATION 1, PLAN 1, RATIO 6

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

```
                      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                      0.      0.      1.      1.      1.      1.      1.      1.      1.      1.
                      1.      1.      1.      2.      2.      2.      3.      4.      5.      6.
                      7.      9.     11.     13.     15.     17.     18.     19.     19.     20.
                     20.     20.     20.     21.     21.     21.     21.     21.     21.     21.
                     21.     22.     22.     22.     22.     22.     22.     22.     22.     22.
                     22.     22.     22.     22.     22.     22.     22.     22.     22.     22.
                                                  STORAGE
                      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
                      0.      0.      0.      1.      2.      3.      3.      4.      5.      5.
                      5.      6.      6.      6.      6.      6.      6.      6.      6.      6.
                      6.      6.      6.      6.      6.      7.      7.      7.      7.      7.
                      7.      8.      8.      9.     10.     11.     13.     14.     16.     17.
                     19.     21.     23.     25.     30.     37.     47.     60.     75.     93.
                    117.    148.    181.    215.    244.    269.    289.    304.    315.    322.
                    327.    331.    334.    336.    338.    341.    343.    345.    346.    348.
                    350.    351.    353.    354.    355.    356.    357.    358.    359.    360.
                    361.    361.    362.    363.    363.    364.    364.    364.    365.    365.
                                                  STAGE
                 1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
                 1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
                 1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
                 1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
                 1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
                 1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0  1956.0
                 1956.0  1956.0  1956.1  1956.1  1956.1  1956.1  1956.1  1956.1  1956.1  1956.1
                 1956.1  1956.1  1956.1  1956.2  1956.2  1956.2  1956.3  1956.4  1956.5  1956.6
                 1956.7  1956.9  1957.1  1957.3  1957.5  1957.7  1957.8  1957.9  1957.9  1958.0
                 1958.0  1958.0  1958.0  1958.1  1958.1  1958.1  1958.1  1958.1  1958.1  1958.1
                 1958.1  1958.2  1958.2  1958.2  1958.2  1958.2  1958.2  1958.2  1958.2  1958.2
                 1958.2  1958.2  1958.2  1958.2  1958.2  1958.2  1958.2  1958.2  1958.2  1958.2

PEAK OUTFLOW IS        22. AT TIME  60.00 HOURS

                            PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
                   CFS       22.      22.       17.        7.         829.
                   CMS        1.       1.        0.        0.          23.
                INCHES               0.08      0.24      0.25         0.25
                    MM               2.04      6.21      6.35         6.35
                 AC-FT                11.       33.       34.          34.
            THOUS CU M                14.       41.       42.          42.

*OVF*
                                    STATION    1

                        INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
          0.     100.    200.    300.    400.    500.    600.    700.    800.    900.      0.      0.      0.
0.30  1I          .       .       .       .       .                                 .       .       .       .
1.00  2I          .       .       .       .       .                                 .       .       .       .
1.30  3I          .       .       .       .       .                                 .       .       .       .
2.00  4I          .       .       .       .       .                                 .       .       .       .
2.30  5I          .       .       .       .       .                                 .       .       .       .
3.00  6I          .       .       .       .       .                                 .       .       .       .
```

3.30 7I
4.00 8I
4.30 9I
5.00 10I
5.30 11I
6.00 12I
6.30 13I
7.00 14I
7.30 15I
8.00 16I
8.30 17I
9.00 18I
9.30 19I
10.00 20I
10.30 21I
11.00 22I
11.30 23I
12.00 24I
12.30 25I
13.00 26I
13.30 27I
14.00 28I
14.30 29I
15.00 30I
15.30 31I
16.00 32I
16.30 330I
17.00 340 I
17.30 350 I
18.00 360 I
18.30 370 I
19.00 380 I
19.30 390I
20.00 400I
20.30 410I
21.00 42I
21.30 43I
22.00 44I
22.30 45I
23.00 46I
23.30 47I
0.00 48I
0.30 49I
1.00 50I
1.30 51I
2.00 52I
2.30 53I
3.00 54I
3.30 55I
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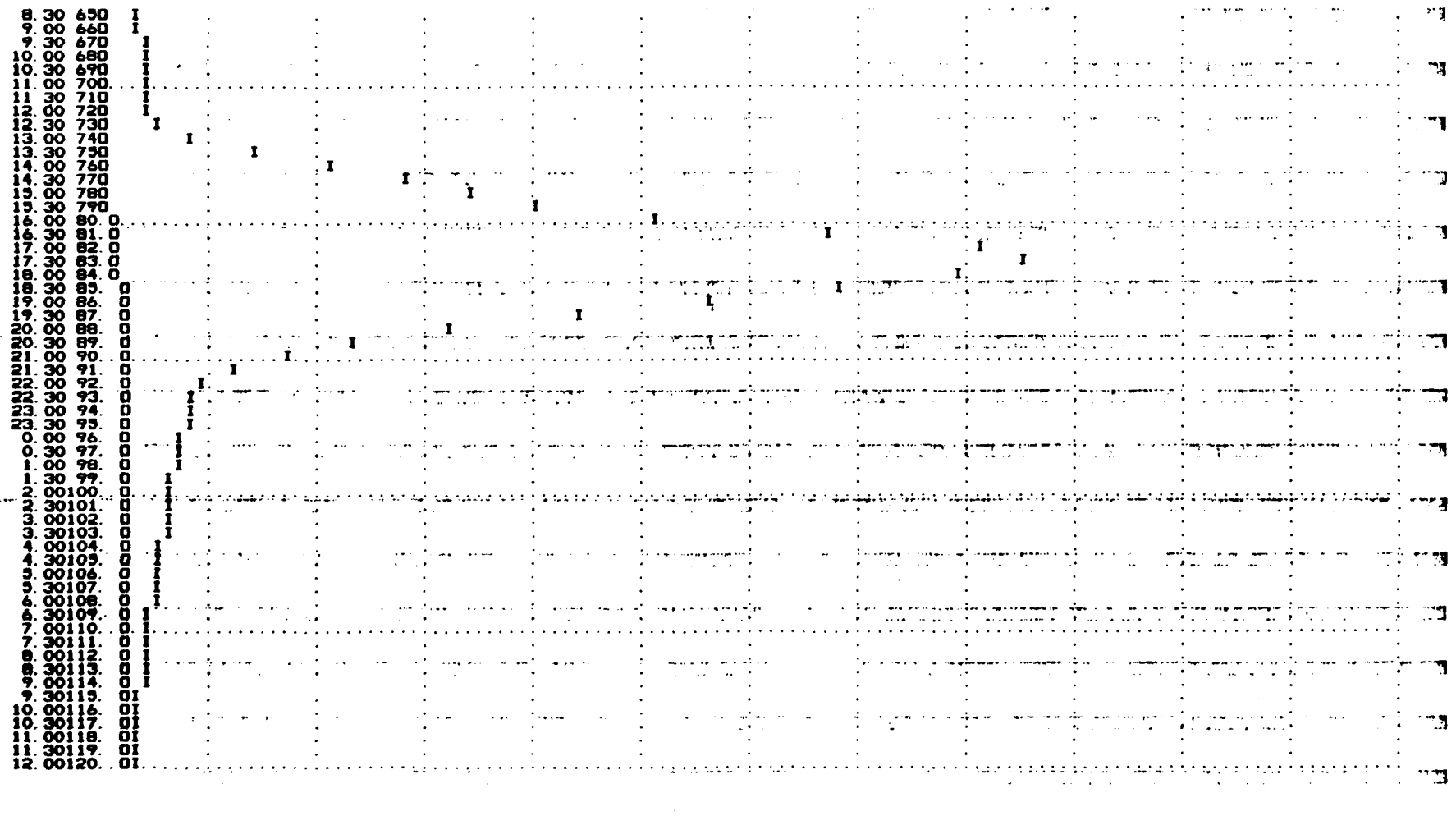
7.30 630 I
8.00 640 I


8.30 650 I
9.00 660 I
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11.00 700 I
11.30 710 I
12.00 720 I
12.30 730 I
13.00 740 I
13.30 750 I
14.00 760 I
14.30 770 I
15.00 780 I
15.30 790 I
16.00 80. O I
16.30 81. O I
17.00 82. O I
17.30 83. O I
18.00 84. O I
18.30 85. O I
19.00 86. O I
19.30 87. O I
20.00 88. O I
20.30 89. O I
21.00 90. O I
21.30 91. O I
22.00 92. O I
22.30 93. O I
23.00 94. O I
23.30 95. O I
0.00 96. O I
0.30 97. O I
1.00 98. O I
1.30 99. O I
2.00100. O I
2.30101. O I
3.00102. O I
3.30103. O I
4.00104. O I
4.30105. O I
5.00106. O I
5.30107. O I
6.00108. O I
6.30109. O I
7.00110. O I
7.30111. O I
8.00112. O I
8.30113. O I
9.00114. O I
9.30115. OI
10.00116. OI
10.30117. OI
11.00118. OI
11.30119. OI
12.00120. OI

OVN

STATION 1, PLAN 1, RATIO 7

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
2.	2.	2.	3.	3.	4.	5.	6.	7.	9.
11.	14.	17.	20.	23.	25.	27.	28.	29.	30.
30.	31.	31.	31.	31.	31.	32.	32.	32.	32.
32.	32.	33.	33.	33.	33.	33.	33.	33.	33.
33.	33.	33.	33.	33.	34.	34.	34.	34.	34.

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	3.	4.	5.	6.	7.	8.
8.	9.	9.	9.	9.	9.	9.	10.	10.	10.
10.	10.	10.	10.	10.	11.	11.	11.	11.	12.
12.	12.	13.	14.	16.	18.	20.	22.	25.	27.
30.	33.	36.	40.	47.	58.	73.	93.	116.	144.
181.	228.	280.	331.	377.	415.	445.	468.	485.	496.
504.	510.	514.	518.	522.	525.	528.	531.	534.	537.
539.	542.	544.	546.	548.	550.	551.	553.	554.	556.
557.	558.	559.	560.	561.	561.	562.	563.	563.	563.

STAGE

1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.1
1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1
1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1
1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1	1956.2	1956.2
1956.2	1956.2	1956.2	1956.3	1956.3	1956.4	1956.5	1956.6	1956.7	1956.9
1957.1	1957.4	1957.7	1958.0	1958.3	1958.5	1958.7	1958.8	1958.9	1959.0
1959.0	1959.1	1959.1	1959.1	1959.1	1959.1	1959.2	1959.2	1959.2	1959.2
1959.2	1959.2	1959.3	1959.3	1959.3	1959.3	1959.3	1959.3	1959.3	1959.3
1959.3	1959.3	1959.3	1959.3	1959.3	1959.4	1959.4	1959.4	1959.4	1959.4

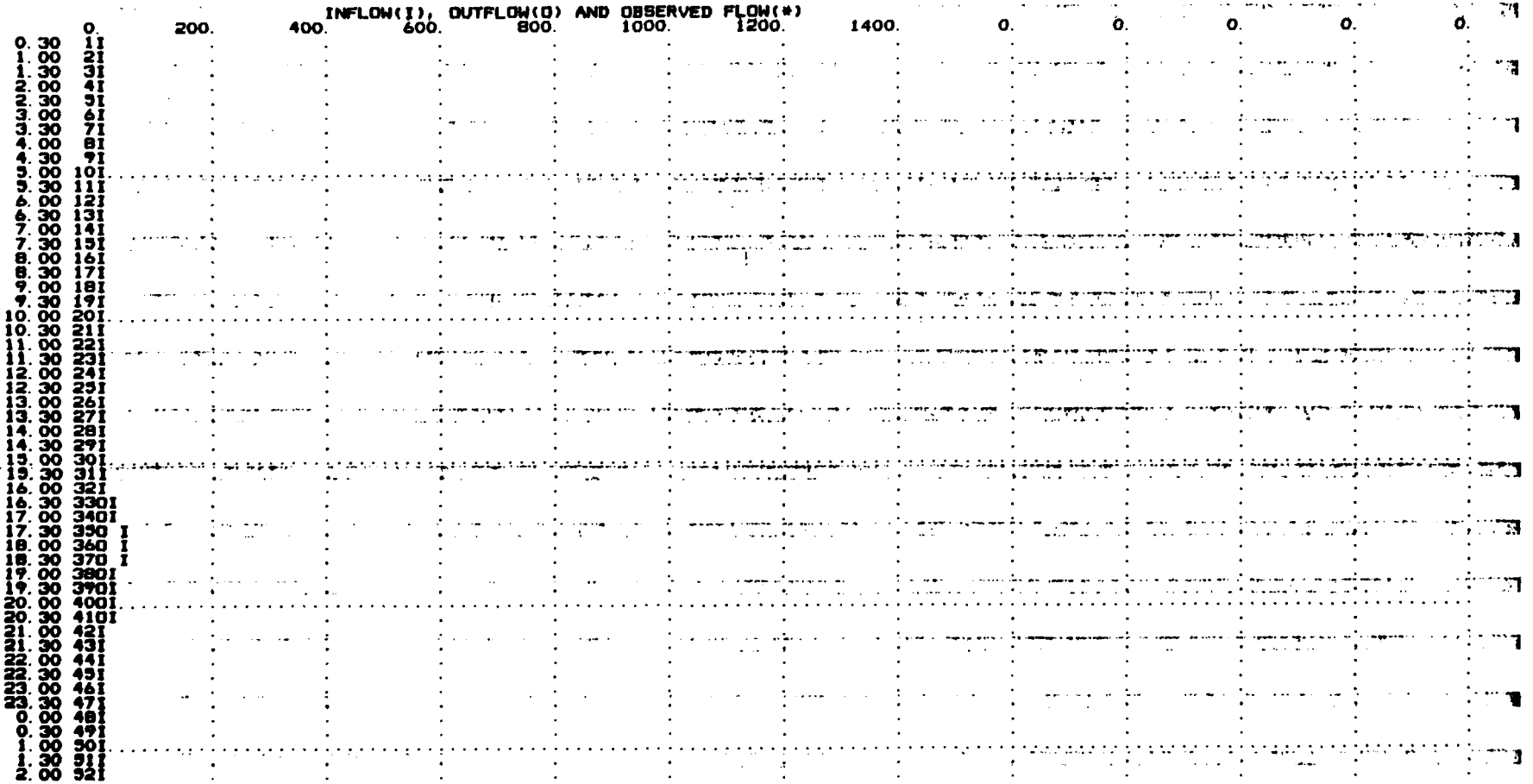
PEAK OUTFLOW IS 34. AT TIME 60.00 HOURS

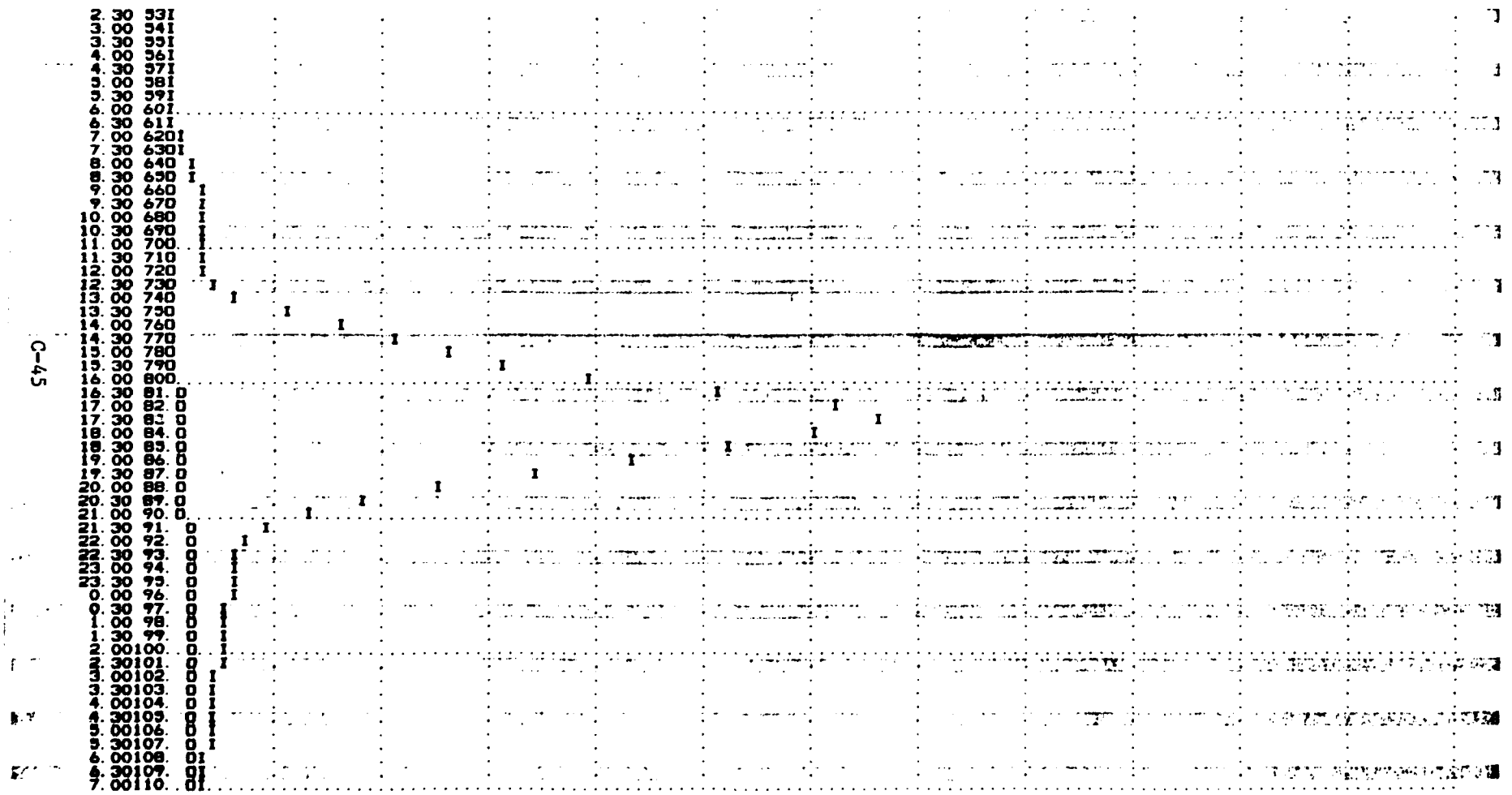
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	34.	33.	26.	10.	1254.
CMS	1.	1.	1.	0.	36.
INCHES		0.12	0.37	0.38	0.38
MM		3.07	9.38	9.61	9.61
AC-FT		17.	51.	52.	52.
THOUS CU M		20.	62.	64.	64.

OVF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

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7.30 6301
8.00 640
8.30 650
9.00 660
9.30 670
10.00 680
10.30 690
11.00 700
11.30 710
12.00 720
12.30 730
13.00 740
13.30 750
14.00 760
14.30 770
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6.00108. 0
6.30109. 0
7.00110. 0

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 7.30111. OI
 8.00112. OI
 8.30113. OI
 9.00114. OI
 9.30115. OI
10.00116. OI
10.30117. I
11.00118. I
11.30119. I
12.00120. I
```

OVN

STATION 1, PLAN 1, RATIO 8

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	3.	3.	3.	4.	4.	4.
5.	5.	6.	6.	8.	9.	12.	15.	18.	22.
28.	34.	39.	44.	48.	51.	54.	56.	57.	58.
59.	60.	61.	63.	65.	67.	69.	71.	73.	74.
76.	77.	79.	80.	81.	82.	83.	84.	84.	85.
85.	86.	86.	86.	87.	87.	87.	87.	87.	88.

STORAGE

0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	2.
2.	2.	3.	5.	8.	12.	15.	18.	20.	22.
23.	24.	24.	25.	25.	25.	25.	26.	26.	26.
26.	27.	27.	27.	28.	28.	29.	30.	30.	31.
32.	33.	35.	38.	42.	47.	52.	58.	65.	71.
77.	84.	91.	102.	119.	147.	185.	234.	293.	364.
456.	572.	703.	831.	945.	1041.	1118.	1176.	1218.	1247.
1268.	1283.	1294.	1304.	1314.	1323.	1332.	1340.	1347.	1355.
1361.	1367.	1373.	1378.	1383.	1388.	1392.	1396.	1399.	1403.
1405.	1408.	1411.	1413.	1415.	1416.	1418.	1419.	1420.	1421.

STAGE

1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.1	1956.1	1956.1	1956.1	1956.1	1956.1
1956.1	1956.2	1956.2	1956.2	1956.2	1956.2	1956.2	1956.2	1956.2	1956.2
1956.2	1956.2	1956.2	1956.2	1956.2	1956.2	1956.2	1956.2	1956.2	1956.2
1956.2	1956.2	1956.2	1956.2	1956.3	1956.3	1956.3	1956.4	1956.4	1956.4
1956.5	1956.5	1956.6	1956.6	1956.8	1956.9	1957.2	1957.5	1957.8	1958.2
1958.8	1959.4	1960.1	1960.8	1961.4	1961.9	1962.3	1962.6	1962.8	1963.0
1963.1	1963.2	1963.2	1963.3	1963.3	1963.4	1963.4	1963.4	1963.5	1963.5

1963.5 1963.6 1963.6 1963.6 1963.7 1963.7 1963.7 1963.7 1963.7 1963.8
1963.8 1963.8 1963.8 1963.8 1963.8 1963.8 1963.8 1963.8 1963.8 1963.8

PEAK OUTFLOW IS 88. AT TIME 60.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	88.	86.	60.	25.	2942.
CMS	2.	2.	2.	1.	83.
INCHES		0.31	0.86	0.87	0.87
MM		7.91	21.93	22.34	22.34
AC-FT		43.	118.	122.	122.
THOUS CU M		53.	146.	150.	150.

OVF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

0. 400. 800. 1200. 1600. 2000. 2400. 2800. 3200. 3600. 0. 0. 0.

```
 0.30  11
 1.00  21
 1.30  31
 2.00  41
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 3.00  61
 3.30  71
 4.00  81
 4.30  91
 5.00 101
 5.30 111
 6.00 121
 6.30 131
 7.00 141
 7.30 151
 8.00 161
 8.30 171
 9.00 181
 9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 330I
17.00 340  I
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18.30 370  I
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19.30 390I
20.00 400I
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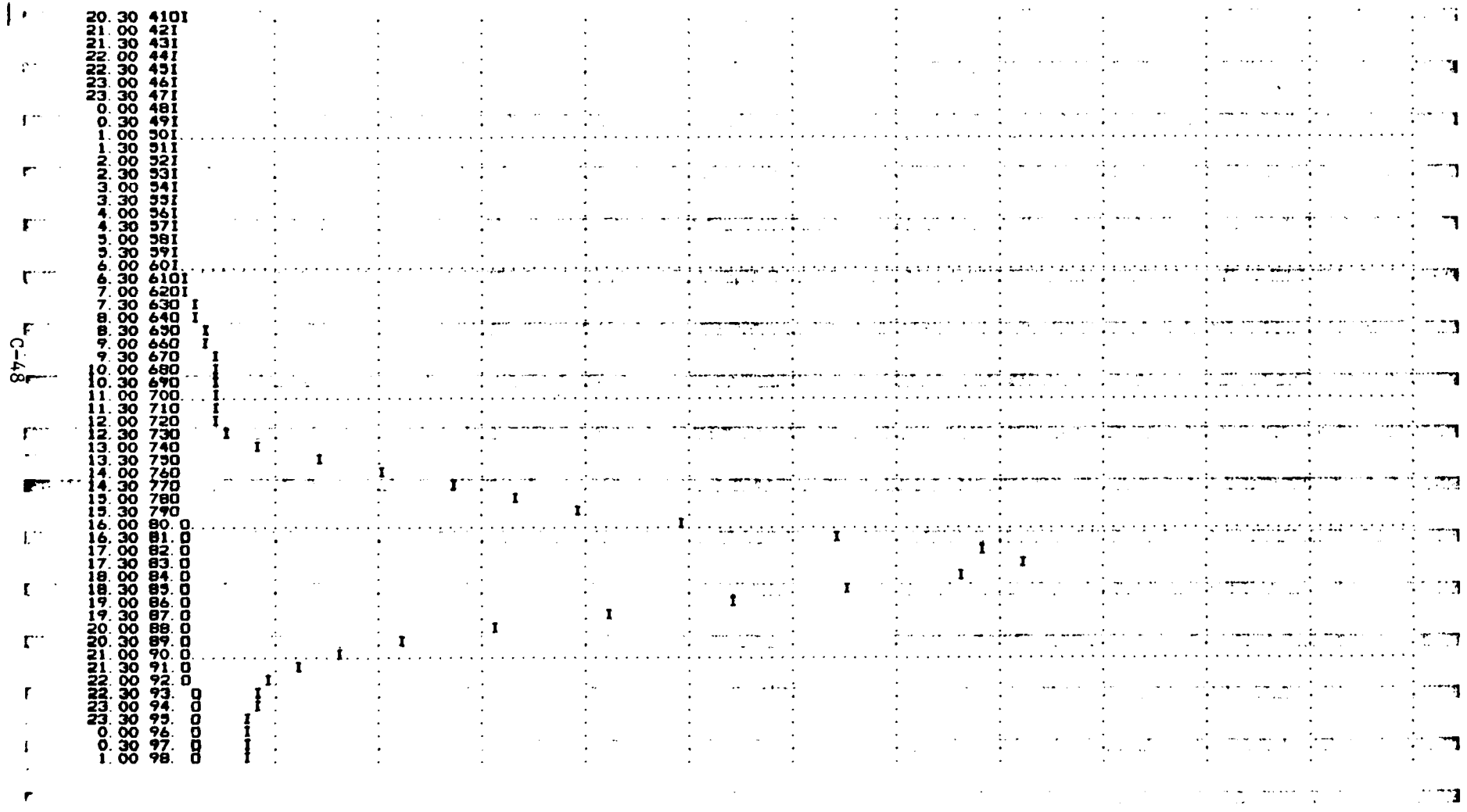
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1.30 51I
2.00 52I
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13.30 750 I
14.00 760 I
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15.00 780 I
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16.00 80.0 I
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18.00 84.0 I
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22.00 92.0 I
22.30 93. 0 I
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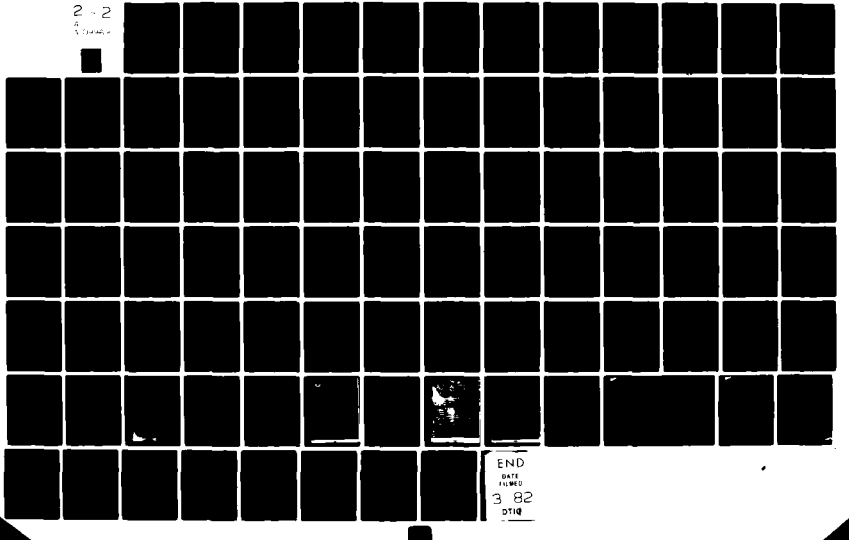
23.30 95. 0 I
0.00 96. 0 I
0.30 97. 0 I
1.00 98. 0 I

AD-A109 969 FLAHERTY-GIAVARA ASSOCIATES NEW HAVEN CT F/G 13/13
NATIONAL DAM SAFETY PROGRAM. LAKE MUSKODAY DAM (INVENTORY NUMBE--ETC(U)
SEP 81 H C FLAHERTY DACW51-81-C-0006
UNCLASSIFIED NL

2 - 2



END
DATE FILMED
3 82
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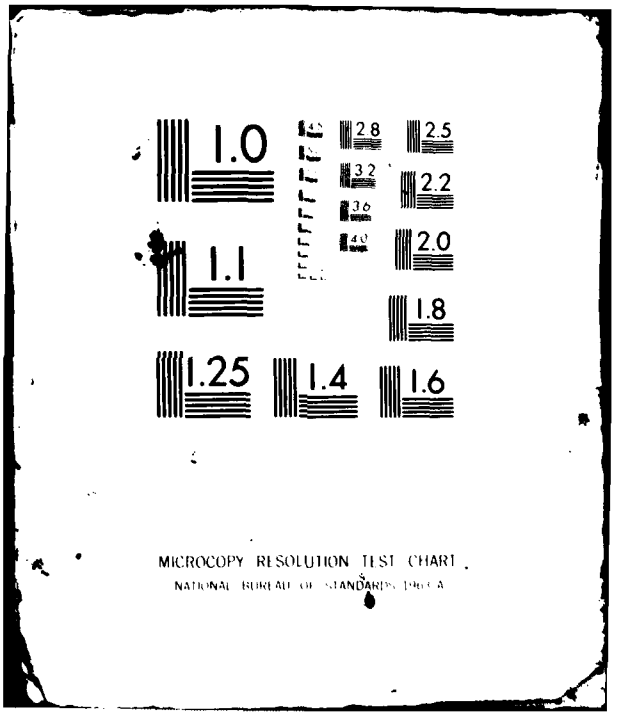
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3.2
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4.0
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

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11. 30119.  01
12. 00120.  01
```

DVN

STATION 1, PLAN 1, RATIO 9

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	2.	2.	2.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	5.	5.	6.	7.	8.	9.	9.
10.	11.	11.	13.	15.	18.	23.	28.	35.	40.
47.	55.	85.	124.	151.	170.	184.	192.	197.	201.
204.	207.	208.	210.	211.	212.	214.	215.	216.	217.
218.	218.	219.	220.	221.	221.	222.	222.	223.	223.
223.	223.	224.	224.	224.	224.	224.	224.	224.	224.

STORAGE

0.	0.	1.	1.	1.	1.	1.	1.	2.	2.
2.	2.	2.	2.	2.	2.	2.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	4.	4.
4.	4.	6.	11.	17.	24.	31.	36.	41.	44.
46.	48.	49.	50.	51.	51.	52.	52.	53.	53.
53.	54.	55.	56.	57.	58.	59.	60.	62.	63.
64.	67.	71.	77.	85.	93.	106.	118.	130.	143.
156.	169.	183.	205.	240.	295.	372.	470.	586.	729.
914.	1147.	1408.	1664.	1890.	2080.	2231.	2344.	2424.	2479.
2517.	2543.	2562.	2579.	2595.	2610.	2624.	2637.	2649.	2661.
2671.	2681.	2689.	2698.	2705.	2712.	2718.	2723.	2728.	2732.
2736.	2739.	2742.	2744.	2746.	2747.	2748.	2748.	2748.	2748.

STAGE

1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0	1956.0
1956.0	1956.0	1956.0	1956.1	1956.1	1956.2	1956.2	1956.2	1956.3	1956.3
1956.3	1956.3	1956.3	1956.3	1956.3	1956.3	1956.3	1956.3	1956.3	1956.3
1956.3	1956.3	1956.3	1956.4	1956.4	1956.4	1956.4	1956.4	1956.4	1956.4
1956.4	1956.4	1956.4	1956.5	1956.5	1956.6	1956.7	1956.7	1956.8	1956.9
1957.0	1957.1	1957.1	1957.3	1957.5	1957.8	1958.3	1958.8	1959.5	1960.3
1961.3	1962.5	1963.8	1965.0	1966.1	1967.0	1967.7	1968.2	1968.5	1968.8
1968.9	1969.0	1969.1	1969.2	1969.3	1969.3	1969.4	1969.4	1969.5	1969.5
1969.6	1969.6	1969.7	1969.7	1969.7	1969.8	1969.8	1969.8	1969.8	1969.8
1969.9	1969.9	1969.9	1969.9	1969.9	1969.9	1969.9	1969.9	1969.9	1969.9

PEAK OUTFLOW IS 224. AT TIME 59.50 HOURS

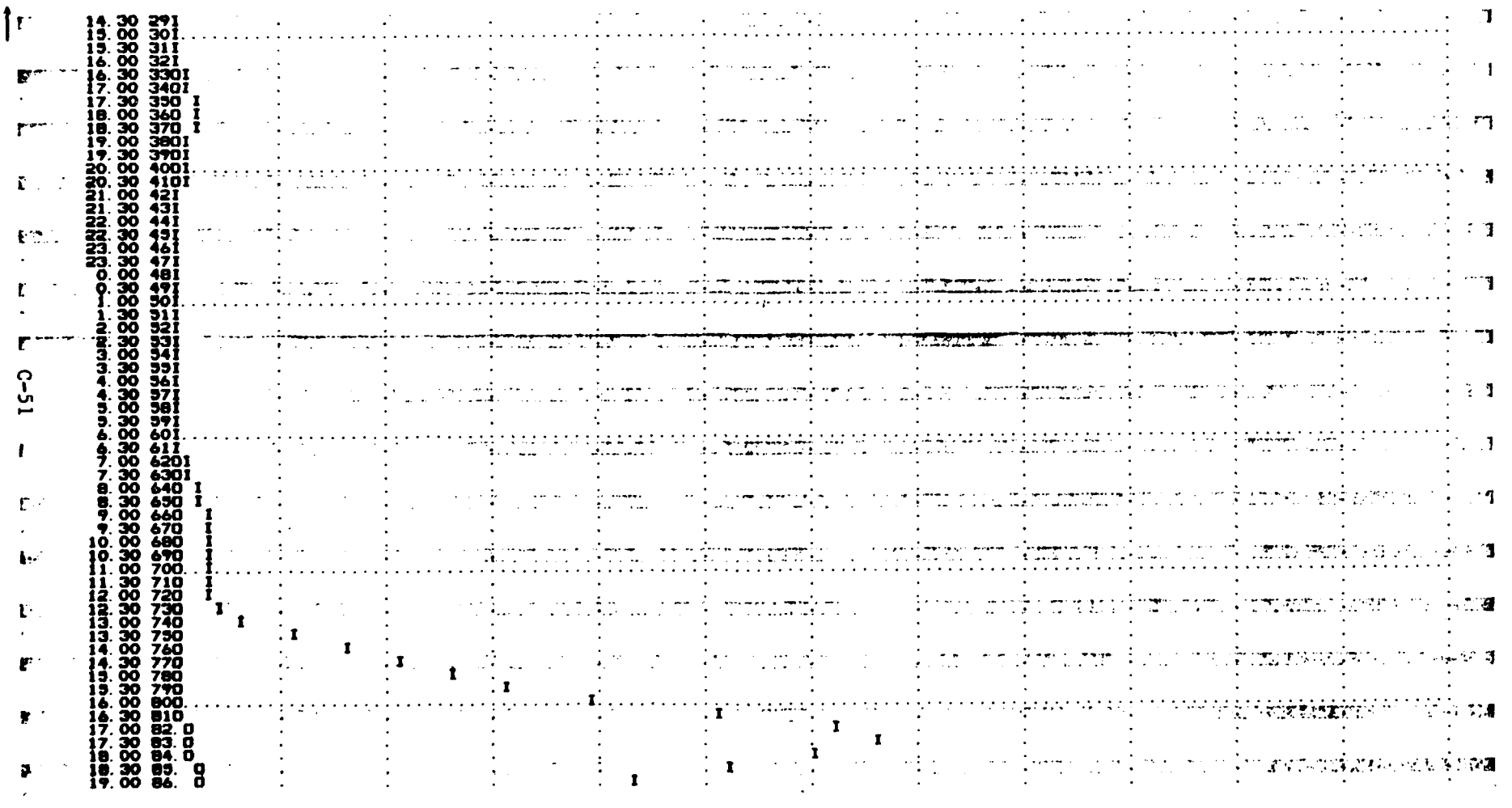
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	224.	224.	168.	68.	8205.
CMS	6.	6.	5.	2.	232.
INCHES		0.81	2.43	2.47	2.47
MM		20.96	61.62	62.86	62.86
AC-FT		111.	332.	339.	339.
THOUS CU M		137.	410.	418.	418.

OVF

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

		0.	1000.	2000.	3000.	4000.	5000.	6000.	7000.	0.	0.	0.	0.	0.
0.30	11	I												
1.00	21	I												
1.30	31	I												
2.00	41	I												
2.30	51	I												
3.00	61	I												
3.30	71	I												
4.00	81	I												
4.30	91	I												
5.00	101	I												
5.30	111	I												
6.00	121	I												
6.30	131	I												
7.00	141	I												
7.30	151	I												
8.00	161	I												
8.30	171	I												
9.00	181	I												
9.30	191	I												
10.00	201	I												
10.30	211	I												
11.00	221	I												
11.30	231	I												
12.00	241	I												
12.30	251	I												
13.00	261	I												
13.30	271	I												
14.00	281	I												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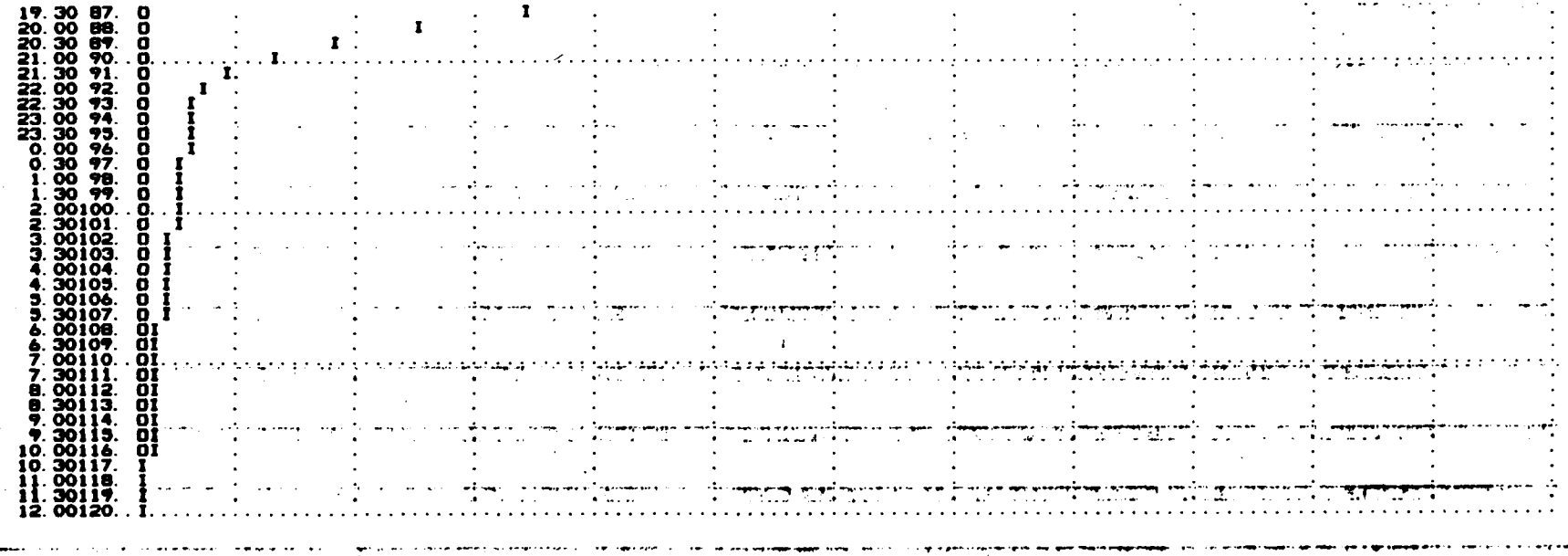
15.00 301
15.30 311
16.00 321
16.30 330I
17.00 340I
17.30 350 I
18.00 360 I
18.30 370 I
19.00 380I
19.30 390I
20.00 400I
20.30 410I
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 6201
7.30 630I
8.00 640 I
8.30 650 I
9.00 660 I
9.30 670 I
10.00 680 I
10.30 690 I
11.00 700 I
11.30 710 I
12.00 720 I
12.30 730 I
13.00 740 I
13.30 750 I
14.00 760 I
14.30 770 I
15.00 780 I
15.30 790 I
16.00 800 I
16.30 810 I
17.00 82.0 I
17.30 83.0 I
18.00 84.0 I
18.30 85.0 I
19.00 86.0 I

C-51



C-52

OVN

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH, LAKE MUSKODAY - SNYDER METHOD

ISTAG	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	1.88	0.00	1.88	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	20.70	111.00	122.00	133.00	143.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS 0.800

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.10	0.00	0.01

UNIT HYDROGRAPH DATA
TP= 1.48 CP=0.63 NTA= 0

RECESSION DATA
STRTQ= -2.00 QRCSN= -0.10 RTIOR= 1.30

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 3.68 AND R= 2.35 INTERVALS

UNIT HYDROGRAPH 15 END-OF-PERIOD ORDINATES, LAG= 1.47 HOURS, CP= 0.63 VOL= 1.00

83.	293.	483.	500.	373.	242.	157.	102.	66.	43.		
28.	18.	12.	8.	5.							

END-OF-PERIOD FLOW

MO. DA	HR. MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO. DA	HR. MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	0.30	1	0.00	0.00	0.00	4.	1.02	6.30	61	0.15	0.10	0.05	35.
1.01	1.00	2	0.00	0.00	0.00	3.	1.02	7.00	62	0.15	0.10	0.05	62.
1.01	1.30	3	0.00	0.00	0.00	3.	1.02	7.30	63	0.15	0.10	0.05	106.
1.01	2.00	4	0.00	0.00	0.00	3.	1.02	8.00	64	0.15	0.10	0.05	152.
1.01	2.30	5	0.00	0.00	0.00	3.	1.02	8.30	65	0.15	0.10	0.05	185.
1.01	3.00	6	0.00	0.00	0.00	3.	1.02	9.00	66	0.15	0.10	0.05	207.
1.01	3.30	7	0.00	0.00	0.00	3.	1.02	9.30	67	0.15	0.10	0.05	222.
1.01	4.00	8	0.00	0.00	0.00	3.	1.02	10.00	68	0.15	0.10	0.05	231.
1.01	4.30	9	0.00	0.00	0.00	3.	1.02	10.30	69	0.15	0.10	0.05	237.
1.01	5.00	10	0.00	0.00	0.00	3.	1.02	11.00	70	0.15	0.10	0.05	241.
1.01	5.30	11	0.00	0.00	0.00	3.	1.02	11.30	71	0.15	0.10	0.05	244.
1.01	6.00	12	0.00	0.00	0.00	2.	1.02	12.00	72	0.15	0.10	0.05	249.
1.01	6.30	13	0.01	0.00	0.01	2.	1.02	12.30	73	0.92	0.87	0.05	311.
1.01	7.00	14	0.01	0.00	0.01	2.	1.02	13.00	74	0.92	0.87	0.05	538.
1.01	7.30	15	0.01	0.00	0.01	2.	1.02	13.30	75	1.10	1.05	0.05	925.
1.01	8.00	16	0.01	0.00	0.01	2.	1.02	14.00	76	1.10	1.05	0.05	1363.
1.01	8.30	17	0.01	0.00	0.01	2.	1.02	14.30	77	1.38	1.33	0.05	1761.
1.01	9.00	18	0.01	0.00	0.01	2.	1.02	15.00	78	1.38	1.33	0.05	2120.
1.01	9.30	19	0.01	0.00	0.01	2.	1.02	15.30	79	1.68	1.63	0.05	2467.
1.01	10.00	20	0.01	0.00	0.01	2.	1.02	16.00	80	3.31	3.26	0.05	3125.
1.01	10.30	21	0.01	0.00	0.01	2.	1.02	16.30	81	1.29	1.24	0.05	4179.
1.01	11.00	22	0.01	0.00	0.01	2.	1.02	17.00	82	1.29	1.24	0.05	5017.
1.01	11.30	23	0.01	0.00	0.01	2.	1.02	17.30	83	1.01	0.96	0.05	5053.
1.01	12.00	24	0.01	0.00	0.01	2.	1.02	18.00	84	1.01	0.96	0.05	4437.
1.01	12.30	25	0.07	0.00	0.07	2.	1.02	18.30	85	0.09	0.04	0.05	3684.
1.01	13.00	26	0.07	0.00	0.07	2.	1.02	19.00	86	0.09	0.04	0.05	2924.
1.01	13.30	27	0.08	0.00	0.08	2.	1.02	19.30	87	0.09	0.04	0.05	2149.
1.01	14.00	28	0.08	0.00	0.08	2.	1.02	20.00	88	0.09	0.04	0.05	1472.
1.01	14.30	29	0.10	0.00	0.10	3.	1.02	20.30	89	0.09	0.04	0.05	988.
1.01	15.00	30	0.10	0.00	0.10	3.	1.02	21.00	90	0.09	0.04	0.05	674.
1.01	15.30	31	0.13	0.00	0.12	3.	1.02	21.30	91	0.09	0.04	0.05	502.
1.01	16.00	32	0.40	0.20	0.20	20.	1.02	22.00	92	0.09	0.04	0.05	482.
1.01	16.30	33	0.10	0.05	0.05	66.	1.02	22.30	93	0.09	0.04	0.05	463.
1.01	17.00	34	0.10	0.05	0.05	118.	1.02	23.00	94	0.09	0.04	0.05	444.
1.01	17.30	35	0.08	0.03	0.05	142.	1.02	23.30	95	0.09	0.04	0.05	427.
1.01	18.00	36	0.08	0.03	0.05	133.	1.03	0.00	96	0.07	0.04	0.05	410.
1.01	18.30	37	0.01	0.00	0.01	112.	1.03	0.30	97	0.00	0.00	0.00	393.
1.01	19.00	38	0.01	0.00	0.01	88.	1.03	1.00	98	0.00	0.00	0.00	378.
1.01	19.30	39	0.01	0.00	0.01	64.	1.03	1.30	99	0.00	0.00	0.00	363.
1.01	20.00	40	0.01	0.00	0.01	43.	1.03	2.00	100	0.00	0.00	0.00	348.
1.01	20.30	41	0.01	0.00	0.01	28.	1.03	2.30	101	0.00	0.00	0.00	334.

1.01	21.00	42	0.01	0.00	0.01	19.	1.03	3.00	102	0.00	0.00	0.00	321.
1.01	21.30	43	0.01	0.00	0.01	14.	1.03	3.30	103	0.00	0.00	0.00	308.
1.01	22.00	44	0.01	0.00	0.01	13.	1.03	4.00	104	0.00	0.00	0.00	296.
1.01	22.30	45	0.01	0.00	0.01	13.	1.03	4.30	105	0.00	0.00	0.00	284.
1.01	23.00	46	0.01	0.00	0.01	12.	1.03	5.00	106	0.00	0.00	0.00	273.
1.01	23.30	47	0.01	0.00	0.01	12.	1.03	5.30	107	0.00	0.00	0.00	262.
1.02	0.00	48	0.01	0.00	0.01	11.	1.03	6.00	108	0.00	0.00	0.00	252.
1.02	0.30	49	0.06	0.01	0.05	11.	1.03	6.30	109	0.00	0.00	0.00	242.
1.02	1.00	50	0.06	0.01	0.05	11.	1.03	7.00	110	0.00	0.00	0.00	232.
1.02	1.30	51	0.06	0.01	0.05	10.	1.03	7.30	111	0.00	0.00	0.00	223.
1.02	2.00	52	0.06	0.01	0.05	16.	1.03	8.00	112	0.00	0.00	0.00	214.
1.02	2.30	53	0.06	0.01	0.05	20.	1.03	8.30	113	0.00	0.00	0.00	206.
1.02	3.00	54	0.06	0.01	0.05	23.	1.03	9.00	114	0.00	0.00	0.00	197.
1.02	3.30	55	0.06	0.01	0.05	24.	1.03	9.30	115	0.00	0.00	0.00	190.
1.02	4.00	56	0.06	0.01	0.05	25.	1.03	10.00	116	0.00	0.00	0.00	182.
1.02	4.30	57	0.06	0.01	0.05	26.	1.03	10.30	117	0.00	0.00	0.00	175.
1.02	5.00	58	0.06	0.01	0.05	27.	1.03	11.00	118	0.00	0.00	0.00	168.
1.02	5.30	59	0.06	0.01	0.05	27.	1.03	11.30	119	0.00	0.00	0.00	161.
1.02	6.00	60	0.06	0.01	0.05	27.	1.03	12.00	120	0.00	0.00	0.00	155.
									SUM	23.68	20.01	3.67	89471.
										(601.)	(508.)	(93.)	(1570.76)

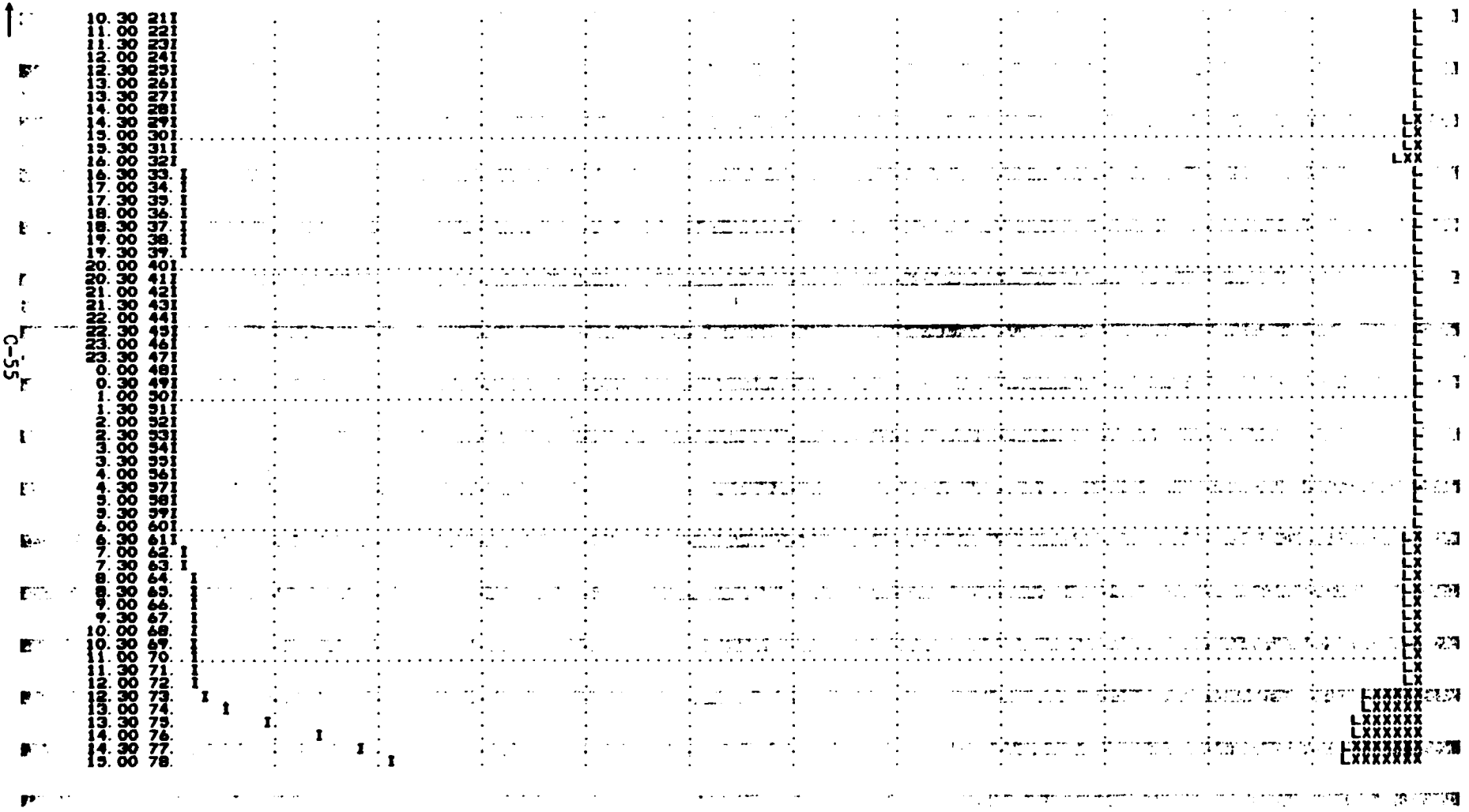
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9093.	3194.	1093.	462.	55393.
CMS	143.	90.	31.	13.	1569.
INCHES		15.81	21.63	22.84	22.84
MM		401.48	549.31	580.16	580.16
AC-FT		1584.	2168.	2289.	2289.
THOUS CU M		1954.	2674.	2823.	2823.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

	0.	1000.	2000.	3000.	4000.	5000.	6000.	0.	0.	0.	0.	0.	0.
	0.	0.	0.	0.	0.	0.	0.	0.	0.	6.	4.	2.	0.
0.30	11												PRECIPITLY AND EXCESS(X)
1.00	21												
1.30	31												
2.00	41												
2.30	51												
3.00	61												
3.30	71												
4.00	81												
4.30	91												
5.00	101												
5.30	111												
6.00	121												
6.30	131												
7.00	141												
7.30	151												
8.00	161												
8.30	171												
9.00	181												
9.30	191												
10.00	201												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14.30 291
15.00 301
15.30 311
16.00 321
16.30 33.
17.00 34.
17.30 35.
18.00 36.
18.30 37.
19.00 38.
19.30 39.
20.00 401
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 62.
7.30 63.
8.00 64.
8.30 65.
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9.30 67.
10.00 68.
10.30 69.
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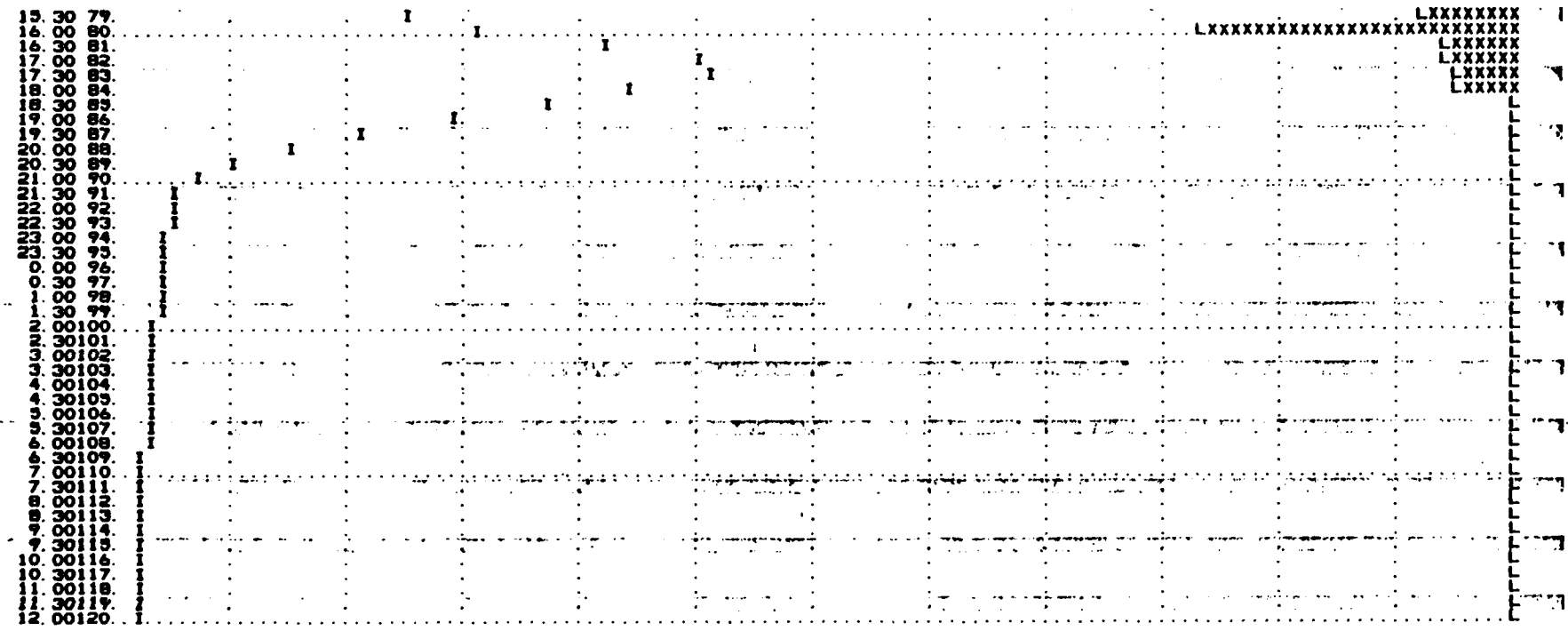


OVN

HYDROGRAPH AT STA 2 FOR PLAN 1, RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
0.	1.	3.	6.	7.	7.	6.	4.	3.	2.	
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	
2.	3.	5.	8.	9.	10.	11.	12.	12.	12.	
12.	12.	16.	27.	46.	68.	88.	106.	123.	136.	
209.	291.	253.	222.	184.	146.	107.	74.	49.	34.	
25.	24.	23.	22.	21.	20.	20.	19.	18.	17.	

17. 11.	16. 11.	15. 10.	15. 10.	14. 9.	14. 9.	13. 9.	13. 8.	12. 8.	12. 8.
		PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME			
	CFS	253.	160.	55.	23.	2770.			
	CMS	7.	5.	2.	1.	78.			
	INCHES		0.79	1.08	1.14	1.14			
	MM		20.07	27.48	29.01	29.01			
	AC-FT		79.	108.	114.	114.			
	THOUS CU M		98.	134.	141.	141.			

HYDROGRAPH AT STA 2 FOR PLAN 1, RTIO 2

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	2.	6.	11.	13.	12.	10.	8.	6.	4.
3.	2.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	2.	2.	2.	2.	2.	2.	2.
3.	6.	10.	14.	17.	19.	20.	21.	21.	22.
22.	22.	28.	48.	83.	123.	159.	191.	222.	281.
376.	452.	455.	399.	332.	263.	193.	132.	89.	61.
45.	43.	42.	40.	38.	37.	35.	34.	33.	31.
30.	29.	28.	27.	26.	25.	24.	23.	22.	21.
20.	19.	19.	18.	17.	16.	16.	15.	15.	14.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	455.	288.	98.	42.	4985.
CMS	13.	8.	3.	1.	141.
INCHES		1.42	1.95	2.06	2.06
MM		36.13	49.46	52.21	52.21
AC-FT		143.	193.	206.	206.
THOUS CU M		176.	241.	254.	254.

HYDROGRAPH AT STA 2 FOR PLAN 1, RTIO 3

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	2.	7.	12.	14.	13.	11.	9.	6.	4.
3.	2.	1.	1.	1.	1.	1.	1.	1.	1.
1.	2.	2.	2.	2.	3.	3.	3.	3.	3.
4.	6.	11.	15.	19.	21.	22.	23.	24.	24.
24.	25.	31.	54.	93.	136.	176.	212.	247.	312.
418.	502.	505.	444.	368.	272.	215.	147.	99.	67.
50.	48.	46.	44.	43.	41.	39.	38.	36.	35.
33.	32.	31.	30.	28.	27.	26.	25.	24.	23.
22.	21.	21.	20.	19.	18.	17.	17.	16.	15.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	505.	319.	109.	46.	5539.
CMS	14.	9.	3.	1.	157.
INCHES		1.98	2.16	2.28	2.28
MM		40.15	54.95	58.02	58.02
AC-FT		158.	217.	229.	229.
THOUS CU M		195.	267.	282.	282.

HYDROGRAPH AT STA 2 FOR PLAN 1, RTIO 4

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	2.	7.	13.	16.	15.	12.	10.	7.	5.
3.	2.	2.	1.	1.	1.	1.	1.	1.	1.
1.	2.	2.	2.	3.	3.	3.	3.	3.	3.
4.	7.	12.	17.	20.	23.	24.	25.	26.	27.
27.	27.	34.	59.	102.	150.	194.	233.	271.	344.
460.	552.	556.	488.	405.	322.	236.	162.	109.	74.
55.	53.	51.	49.	47.	45.	43.	42.	40.	38.
37.	35.	34.	33.	31.	30.	29.	28.	27.	26.
25.	24.	23.	22.	21.	20.	19.	18.	18.	17.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	556.	351.	120.	51.	6093.
CMS	16.	10.	3.	1.	173.
INCHES		1.74	2.38	2.51	2.51
MM		44.16	60.45	63.82	63.82
AC-FT		174.	238.	252.	252.
THOUS CU M		215.	294.	311.	311.

HYDROGRAPH AT STA 2 FOR PLAN 1, RTIO 5

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	2.	8.	14.	17.	16.	13.	11.	8.	5.
3.	2.	2.	2.	2.	1.	1.	1.	1.	1.
1.	2.	2.	3.	3.	3.	3.	3.	3.	3.
4.	7.	13.	18.	22.	25.	27.	28.	28.	29.
29.	29.	37.	65.	111.	164.	211.	254.	296.	375.
501.	602.	606.	532.	442.	351.	258.	177.	119.	81.
60.	58.	56.	53.	51.	49.	47.	45.	44.	42.
40.	39.	37.	36.	34.	33.	31.	30.	29.	28.
27.	26.	25.	24.	23.	22.	21.	20.	19.	19.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	606.	383.	131.	59.	6647.
CMS	17.	11.	4.	2.	188.
INCHES		1.90	2.60	2.74	2.74
MM		48.18	65.94	69.62	69.62
AC-FT		190.	260.	275.	275.
THOUS CU M		234.	321.	339.	339.

HYDROGRAPH AT STA 2 FOR PLAN 1, RTIO 6

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	3.	9.	15.	18.	17.	15.	11.	8.	6.
4.	2.	2.	2.	2.	2.	2.	1.	1.	1.
1.	2.	3.	3.	3.	3.	3.	4.	4.	4.
5.	8.	14.	20.	24.	27.	29.	30.	31.	31.
32.	32.	40.	70.	120.	177.	229.	276.	321.	406.
543.	652.	657.	577.	479.	380.	279.	191.	128.	88.
65.	63.	60.	58.	55.	53.	51.	49.	47.	45.
43.	42.	40.	39.	37.	36.	34.	33.	31.	30.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	657.	415.	142.	60.	7201.
CMS	19.	12.	4.	2.	204.
INCHES		2.05	2.81	2.97	2.97
MM		52.19	71.44	75.42	75.42
AC-FT		206.	282.	298.	298.
THOUS CU M		254.	348.	367.	367.

HYDROGRAPH AT STA 2 FOR PLAN 1, RTIO 7

29.	28.	27.	26.	25.	24.	23.	22.	21.	20.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	4.	13.	24.	28.	27.	22.	18.	13.	9.
6.	4.	3.	3.	3.	2.	2.	2.	2.	2.
2.	3.	4.	5.	5.	5.	5.	5.	5.	5.
7.	12.	21.	30.	37.	41.	44.	46.	47.	48.
49.	49.	62.	108.	185.	273.	352.	424.	493.	625.
836.	1003.	1011.	887.	737.	585.	430.	294.	198.	139.
100.	96.	93.	89.	85.	82.	79.	76.	73.	70.
67.	64.	62.	59.	57.	55.	52.	50.	48.	46.
45.	43.	41.	39.	38.	36.	35.	34.	32.	31.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1011.	639.	219.	92.	11079.
CMS	29.	18.	6.	3.	314.
INCHES		3.16	4.33	4.57	4.57
MM		80.30	109.90	116.03	116.03
AC-FT		317.	434.	458.	458.
THOUS CU M		391.	535.	565.	565.

HYDROGRAPH AT STA 2 FOR PLAN 1, RTIO 8

2.	2.	2.	2.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
2.	10.	33.	59.	71.	67.	56.	44.	32.	21.
14.	9.	7.	7.	6.	6.	6.	6.	5.	5.
5.	8.	10.	11.	12.	13.	13.	13.	13.	14.
18.	31.	53.	76.	93.	104.	111.	116.	119.	120.
122.	123.	156.	269.	463.	681.	881.	1060.	1234.	1362.
2090.	2509.	2926.	2218.	1842.	1462.	1074.	736.	494.	337.
251.	241.	231.	222.	213.	205.	197.	189.	181.	174.
167.	161.	154.	148.	142.	137.	131.	126.	121.	116.
111.	107.	103.	99.	95.	91.	87.	84.	81.	77.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2526.	1597.	547.	231.	27697.
CMS	72.	45.	15.	7.	784.
INCHES		7.90	10.82	11.42	11.42
MM		200.74	274.75	290.08	290.08
AC-FT		792.	1084.	1144.	1144.
THOUS CU M		977.	1337.	1412.	1412.

HYDROGRAPH AT STA 2 FOR PLAN 1, RTIO 9

4.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	3.	3.
9.	20.	66.	118.	142.	133.	112.	88.	64.	43.
28.	19.	14.	13.	13.	12.	12.	11.	11.	11.
10.	16.	20.	23.	24.	25.	26.	27.	27.	27.
35.	62.	106.	152.	185.	207.	222.	231.	237.	241.
244.	245.	311.	538.	925.	1363.	1761.	2120.	2467.	3125.
4179.	5017.	5053.	4437.	3684.	2924.	2149.	1472.	988.	674.
902.	482.	463.	444.	427.	410.	393.	378.	363.	348.
334.	321.	308.	296.	284.	273.	262.	252.	242.	232.
223.	214.	206.	197.	190.	182.	175.	168.	161.	155.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5053.	3194.	1093.	462.	55393.
CMS	143.	90.	31.	13.	1569.
INCHES		15.81	21.63	22.84	22.84
MM		401.48	549.51	580.16	580.16
AC-FT		1584.	2168.	2289.	2289.
THOUS CU M		1954.	2674.	2823.	2823.

********** ********** ********** ********** **********

COMBINE HYDROGRAPHS

OUTFLOW FROM TENNANAH LAKE COMBINED WITH INFLOW AT LAKE MUSKODAY

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	2	0	0	0	0	1	0	0

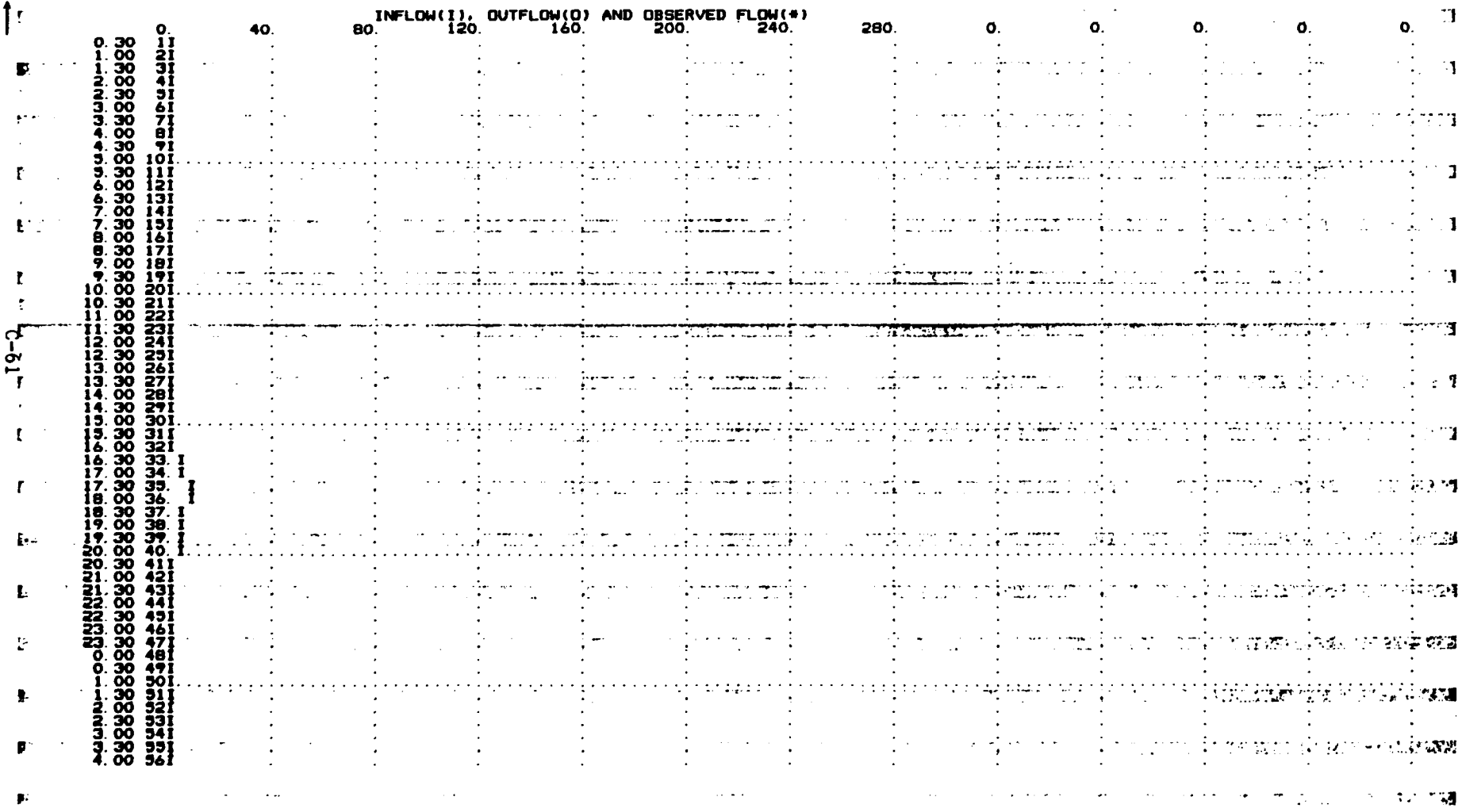
SUM OF 2 HYDROGRAPHS AT 2 PLAN 1 RTIO 1

0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	3.	6.	7.	7.	6.	4.	3.	2.
2.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
2.	3.	9.	8.	9.	11.	11.	12.	12.	12.
13.	13.	16.	28.	47.	69.	89.	107.	125.	138.
212.	254.	257.	227.	190.	153.	114.	81.	57.	41.
33.	32.	31.	30.	29.	29.	28.	27.	26.	26.
25.	25.	24.	23.	23.	22.	22.	21.	21.	20.
20.	19.	19.	19.	18.	18.	17.	17.	17.	16.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	257.	164.	61.	26.	3094.
CMS	7.	5.	2.	1.	88.
INCHES		0.34	0.51	0.54	0.54
MM		8.69	12.94	13.69	13.69
AC-FT		81.	121.	128.	128.
THOUS CU M		100.	149.	158.	158.

OVF

STATION 2


INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
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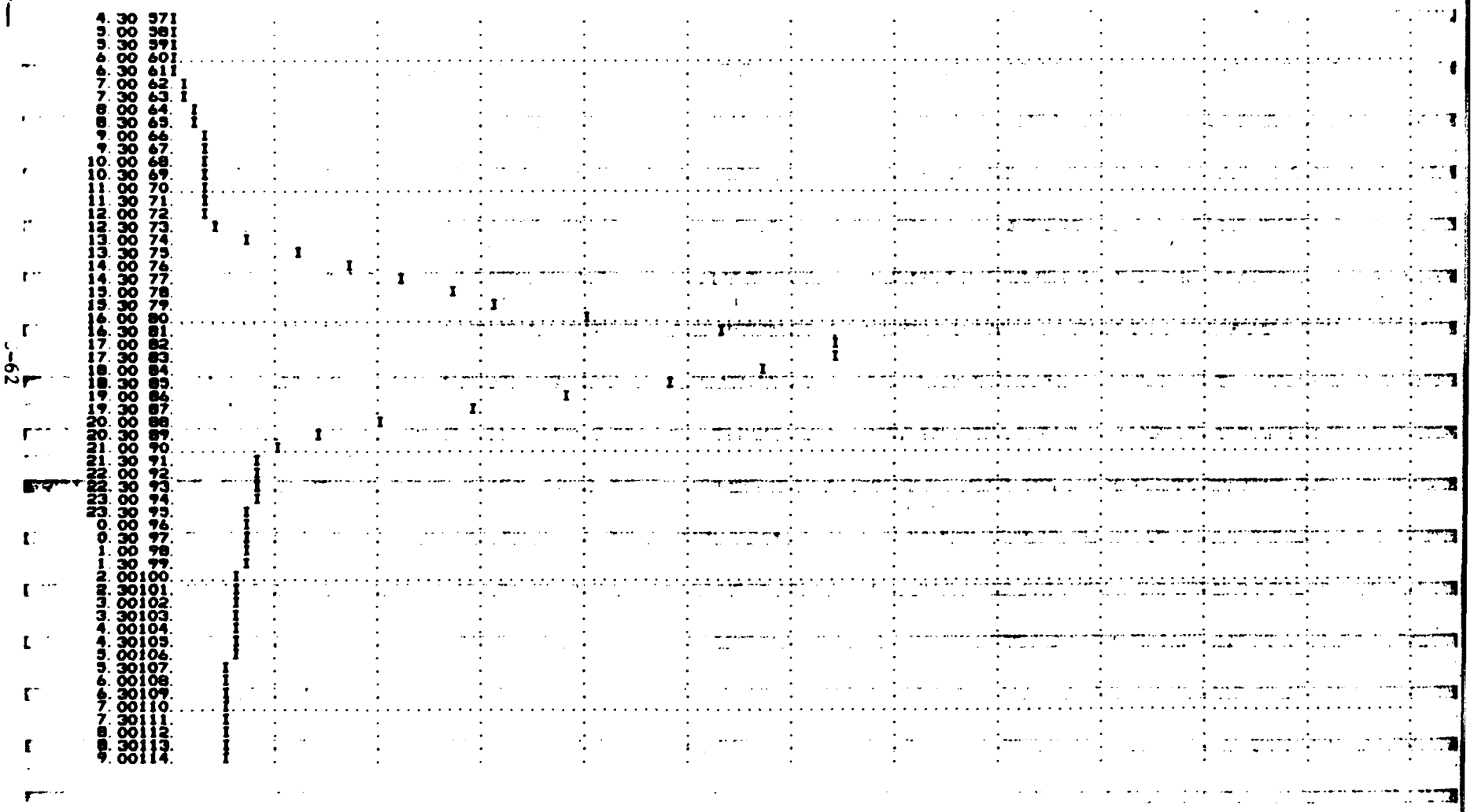
1.30 31
2.00 41
2.30 51
3.00 61
3.30 71
4.00 81
4.30 91
5.00 101
5.30 111
6.00 121
6.30 131
7.00 141
7.30 151
8.00 161
8.30 171
9.00 181
9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 33. I
17.00 34. I
17.30 35. I
18.00 36. I
18.30 37. I
19.00 38. I
19.30 39. I
20.00 40. I
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561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5.00 58
5.30 59
6.00 60
6.30 61
7.00 62
7.30 63
8.00 64
8.30 65
9.00 66
9.30 67
10.00 68
10.30 69
11.00 70
11.30 71
12.00 72
12.30 73
13.00 74
13.30 75
14.00 76
14.30 77
15.00 78
15.30 79
16.00 80
16.30 81
17.00 82
17.30 83
18.00 84
18.30 85
19.00 86
19.30 87
20.00 88
20.30 89
21.00 90
21.30 91
22.00 92
22.30 93
23.00 94
23.30 95
0.00 96
0.30 97
1.00 98
1.30 99
2.00100
2.30101
3.00102
3.30103
4.00104
4.30105
5.00106
5.30107
6.00108
6.30109
7.00110
7.30111
8.00112
8.30113
9.00114

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 9.30115.    I
10.00116.   I
10.30117.   I
11.00118.   I
11.30119.   I
12.00120.   I
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OVN

SUM OF 2 HYDROGRAPHS AT 2 PLAN 1 RTIO 2

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	2.	6.	11.	13.	12.	10.	8.	6.	4.
3.	3.	3.	1.	1.	1.	1.	1.	1.	1.
1.	2.	2.	2.	2.	3.	3.	3.	3.	3.
3.	6.	10.	14.	17.	19.	21.	21.	22.	22.
23.	23.	29.	50.	85.	124.	161.	193.	225.	255.
381.	458.	463.	409.	342.	275.	206.	146.	102.	74.
59.	58.	56.	54.	53.	51.	50.	49.	48.	46.
45.	44.	43.	42.	41.	40.	39.	38.	37.	36.
36.	35.	34.	33.	33.	32.	31.	31.	30.	30.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	463.	294.	110.	46.	5565.
CMS	13.	8.	3.	1.	158.
INCHES		0.62	0.92	0.97	0.97
MM		15.63	23.26	24.62	24.62
AC-FT		146.	217.	230.	230.
THOUS CU M		180.	268.	284.	284.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

```
      0.        50.       100.       150.       200.       250.       300.       350.       400.       450.       500.        0.        0.
0.30 11
1.00 21
1.30 31
2.00 41
2.30 51
3.00 61
3.30 71
4.00 81
4.30 91
5.00 101
5.30 111
6.00 121
6.30 131
7.00 141
7.30 151
8.00 161
8.30 171
9.00 181
9.30 191
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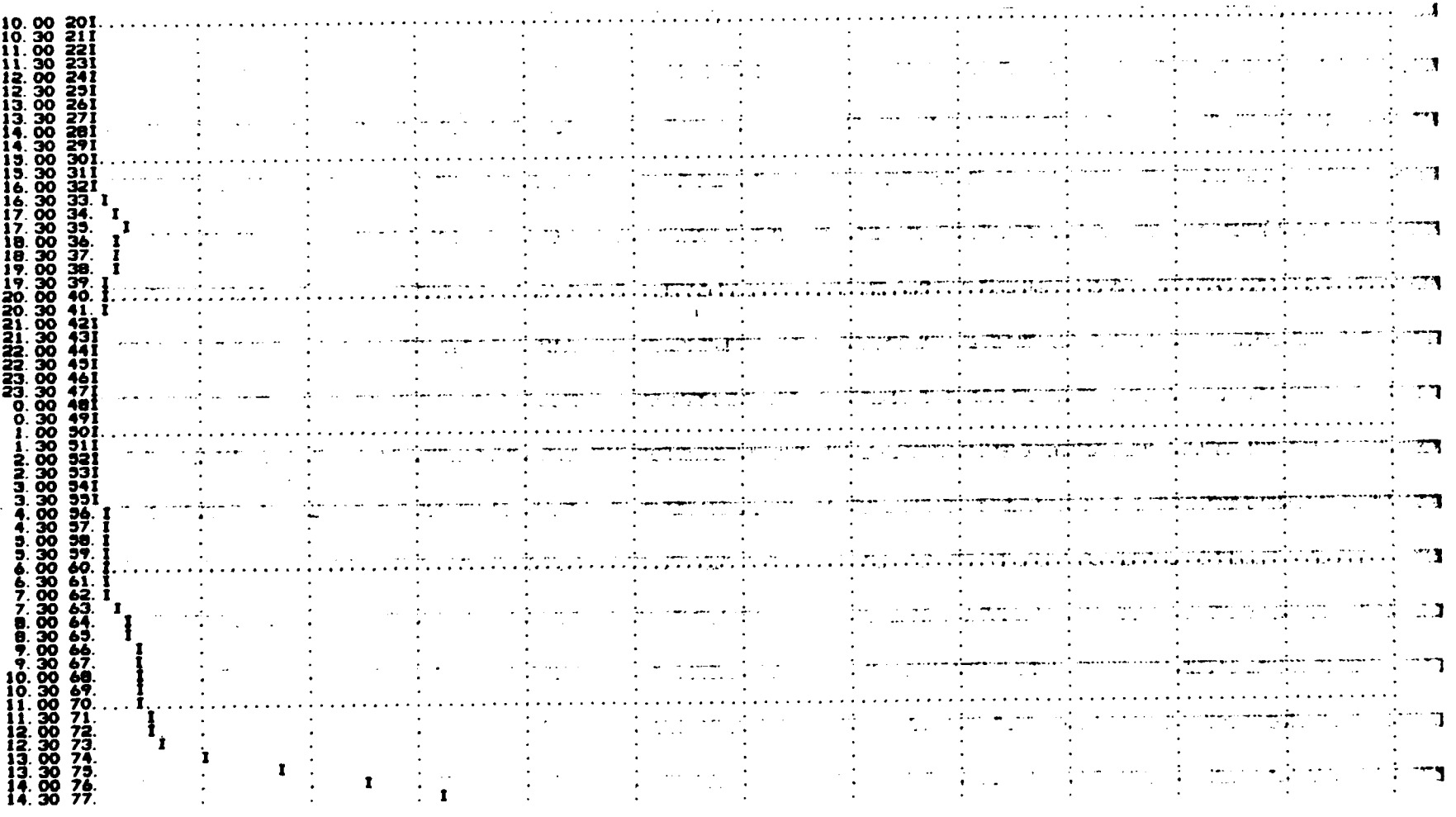
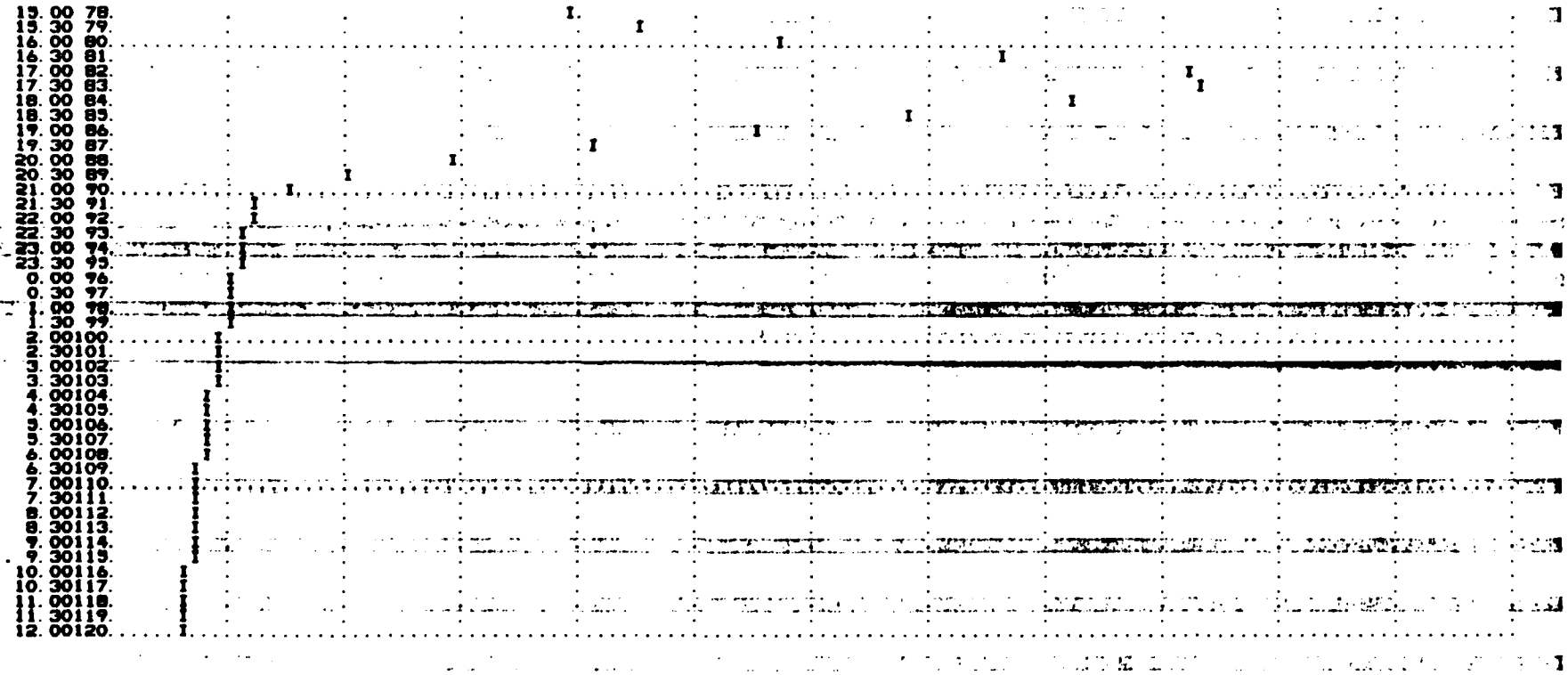

10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 331
17.00 341
17.30 351
18.00 361
18.30 371
19.00 381
19.30 391
20.00 401
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 621
7.30 631
8.00 641
8.30 651
9.00 661
9.30 671
10.00 681
10.30 691
11.00 701
11.30 711
12.00 721
12.30 731
13.00 741
13.30 751
14.00 761
14.30 771



C-65

DVN

SUM OF 2 HYDROGRAPHS AT 2 PLAN 1 RTIO 3

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	2.	7.	12.	14.	13.	11.	9.	7.	5.
3.	2.	2.	2.	2.	2.	1.	1.	1.	1.
1.	2.	2.	3.	3.	3.	3.	3.	3.	3.
4.	7.	11.	16.	19.	21.	23.	24.	24.	29.
25.	26.	32.	55.	94.	138.	178.	215.	250.	317.

424.	509.	514.	454.	380.	305.	229.	162.	114.	83.	
66.	64.	62.	60.	59.	57.	56.	54.	53.	51.	
50.	49.	48.	46.	45.	44.	43.	42.	41.	40.	
39.	39.	38.	37.	36.	35.	35.	34.	33.	33.	

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	514.	327.	122.	92.	6182.
CMS	15.	9.	3.	1.	175.
INCHES		0.68	1.02	1.08	1.08
MM		17.37	25.84	27.35	27.35
AC-FT		162.	241.	255.	255.
THOUS CU M		200.	298.	315.	315.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(#)

0. 50. 100. 150. 200. 250. 300. 350. 400. 450. 500. 550. 0.

0.30	11	
1.00	21	
1.30	31	
2.00	41	
2.30	51	
3.00	61	
3.30	71	
4.00	81	
4.30	91	
5.00	101	
5.30	111	
6.00	121	
6.30	131	
7.00	141	
7.30	151	
8.00	161	
8.30	171	
9.00	181	
9.30	191	
10.00	201	
10.30	211	
11.00	221	
11.30	231	
12.00	241	
12.30	251	
13.00	261	
13.30	271	
14.00	281	
14.30	291	
15.00	301	
15.30	311	
16.00	321	
16.30	33. I	
17.00	34. I	
17.30	35. I	
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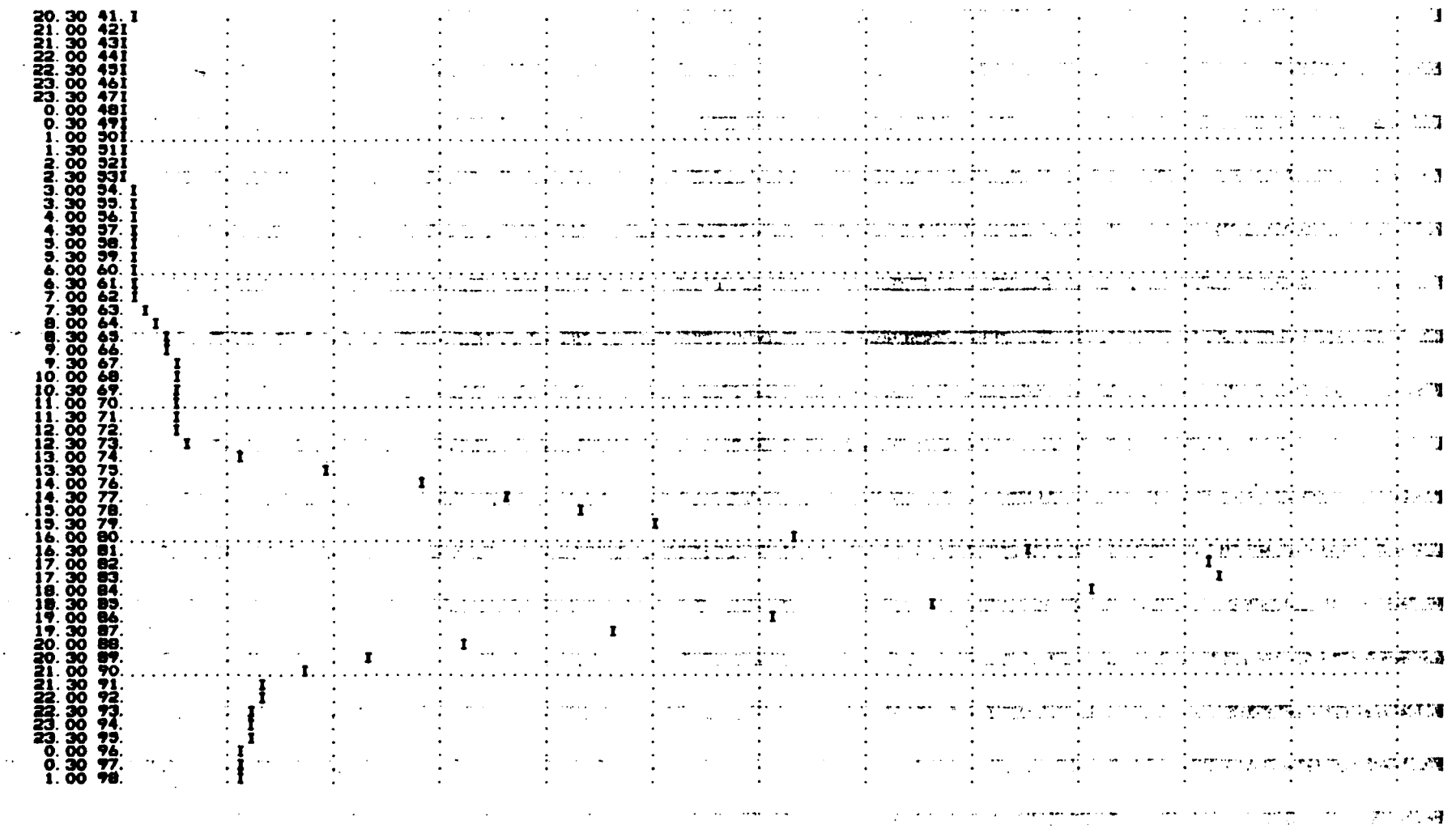
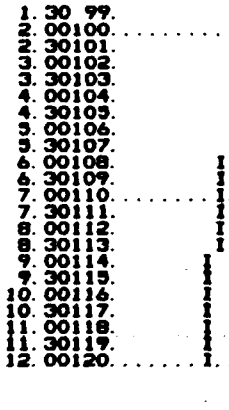




OVN

SUM OF 2 HYDROGRAPHS AT 2 PLAN 1 RTIO 4

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	
0.	2.	7.	13.	16.	15.	12.	10.	7.	5.	
3.	2.	2.	2.	2.	2.	2.	2.	2.	1.	
1.	2.	3.	3.	3.	3.	3.	3.	3.	3.	
4.	7.	12.	17.	21.	23.	25.	26.	27.	27.	
28.	28.	35.	61.	103.	152.	196.	236.	279.	349.	
466.	560.	565.	499.	418.	336.	252.	178.	125.	91.	
72.	70.	68.	66.	65.	63.	61.	60.	58.	56.	
55.	54.	52.	51.	50.	49.	47.	46.	45.	44.	
43.	42.	41.	41.	40.	39.	38.	37.	37.	36.	

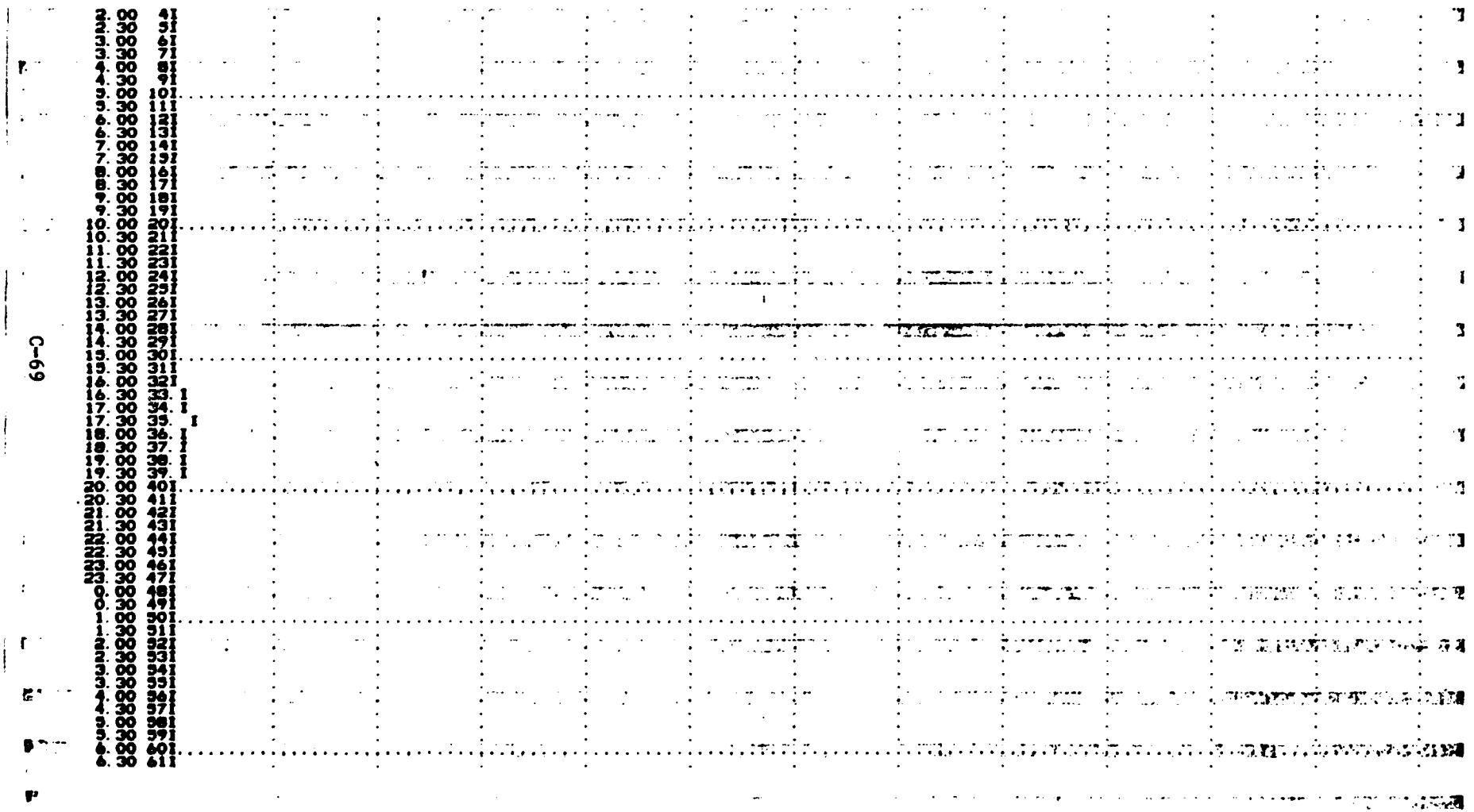
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	565.	360.	134.	57.	6798.
CMS	16.	10.	4.	2.	193.
INCHES		0.75	1.12	1.18	1.18
MM		19.10	28.42	30.08	30.08
AC-FT		178.	265.	281.	281.
THOUS CU M		220.	327.	347.	347.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

0.	100.	200.	300.	400.	500.	600.	0.	0.	0.	0.	0.	0.
0.30 11												
1.00 21												
1.30 31												


2.00 41
2.30 51
3.00 61
3.30 71
4.00 81
4.30 91
5.00 101
5.30 111
6.00 121
6.30 131
7.00 141
7.30 151
8.00 161
8.30 171
9.00 181
9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
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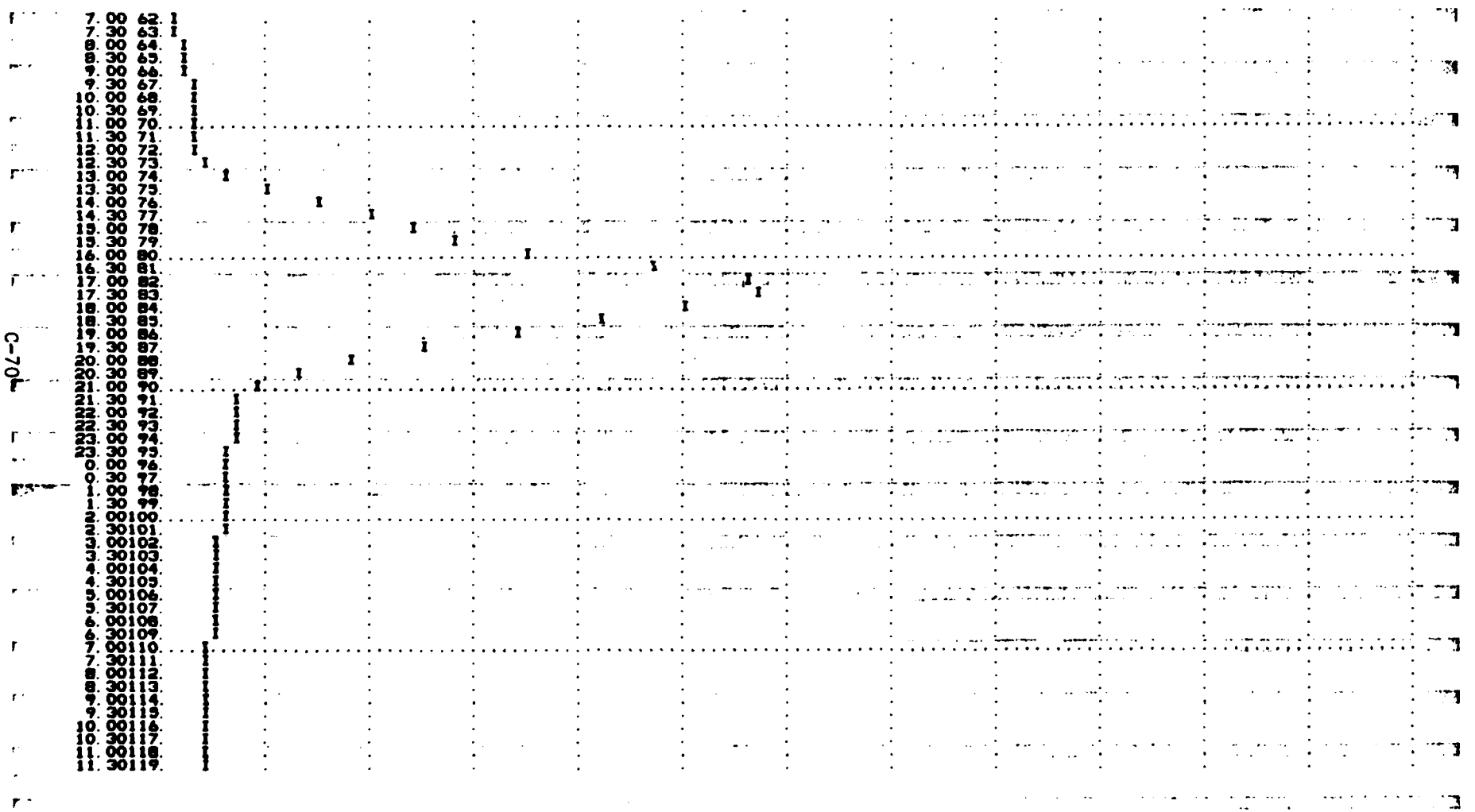
16.00 321
16.30 331
17.00 341
17.30 351
18.00 361
18.30 371
19.00 381
19.30 391
20.00 401
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611

C-69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21.30 91.
22.00 92.
22.30 93.
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7.30111.
8.00112.
8.30113.
9.00114.
9.30115.
10.00116.
10.30117.
11.00118.
11.30119.

C-70

12.00120....I.....

OVN

SUM OF 2 HYDROGRAPHS AT 2 PLAN 1 RTIO 5

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	2.	8.	14.	17.	16.	14.	11.	8.	5.
4.	3.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	3.	3.	3.	3.	4.	4.	4.	4.
5.	8.	13.	19.	23.	26.	27.	29.	29.	30.
30.	31.	39.	66.	113.	166.	214.	258.	300.	380.
308.	611.	617.	545.	456.	366.	274.	194.	137.	99.
79.	77.	74.	72.	70.	68.	67.	65.	63.	62.
60.	58.	57.	56.	54.	53.	52.	51.	49.	48.
47.	46.	45.	44.	43.	42.	42.	41.	40.	39.

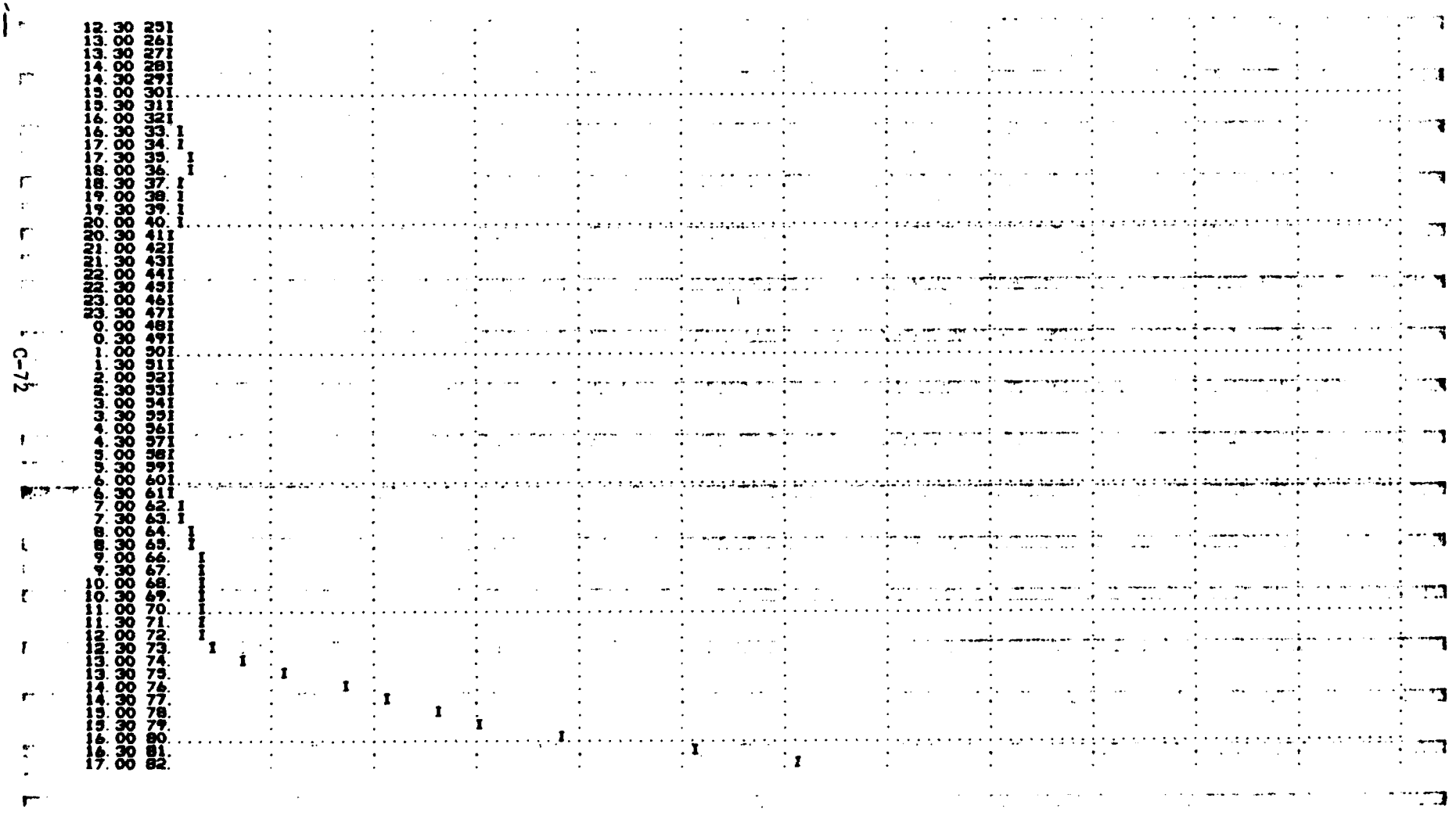
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	617.	393.	146.	62.	7415.
CMS	17.	11.	4.	2.	210.
INCHES		0.82	1.22	1.29	1.29
MM		20.84	30.99	32.81	32.81
AC-FT		195.	289.	306.	306.
THOUS CU M		240.	357.	378.	378.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

		0.	100.	200.	300.	400.	500.	600.	700.	0.	0.	0.	0.	0.
0.30	11													
1.00	21													
1.30	31													
2.00	41													
2.30	51													
3.00	61													
3.30	71													
4.00	81													
4.30	91													
5.00	101													
5.30	111													
6.00	121													
6.30	131													
7.00	141													
7.30	151													
8.00	161													
8.30	171													
9.00	181													
9.30	191													
10.00	201													
10.30	211													
11.00	221													
11.30	231													
12.00	241													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18.00 36.
18.30 37.
19.00 38.
19.30 39.
20.00 40.
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 62.
7.30 63.
8.00 64.
8.30 65.
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9.30 67.
10.00 68.
10.30 69.
11.00 70.
11.30 71.
12.00 72.
12.30 73.
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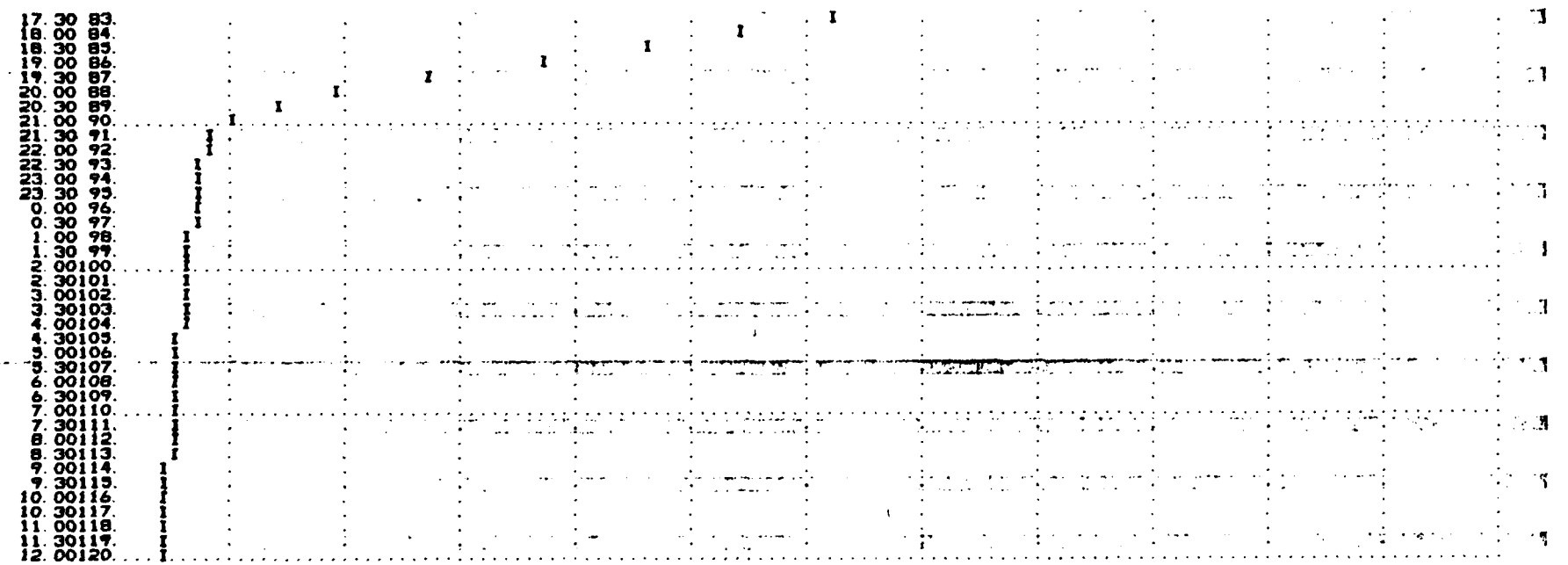
17.00 82.



DVN

SUM OF 2 HYDROGRAPHS AT 2 PLAN 1 RTIO 6

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0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	3.	9.	15.	19.	17.	15.	12.	9.	6.
4.	3.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	3.	3.	4.	4.	4.	4.	4.	4.
5.	9.	14.	20.	25.	28.	30.	31.	32.	32.
33.	33.	42.	72.	122.	180.	232.	279.	326.	412.
591.	662.	668.	590.	494.	397.	297.	210.	148.	107.
85.	83.	81.	78.	76.	74.	72.	70.	68.	67.
65.	63.	62.	60.	59.	57.	56.	55.	53.	52.
51.	50.	49.	48.	47.	46.	45.	44.	43.	42.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	668.	425.	158.	67.	8030.
CMS	19.	12.	4.	2.	227.
INCHES		0.89	1.32	1.40	1.40
MM		22.58	33.57	35.53	35.53
AC-FT		211.	313.	332.	332.
THOUS CU M		260.	387.	409.	409.

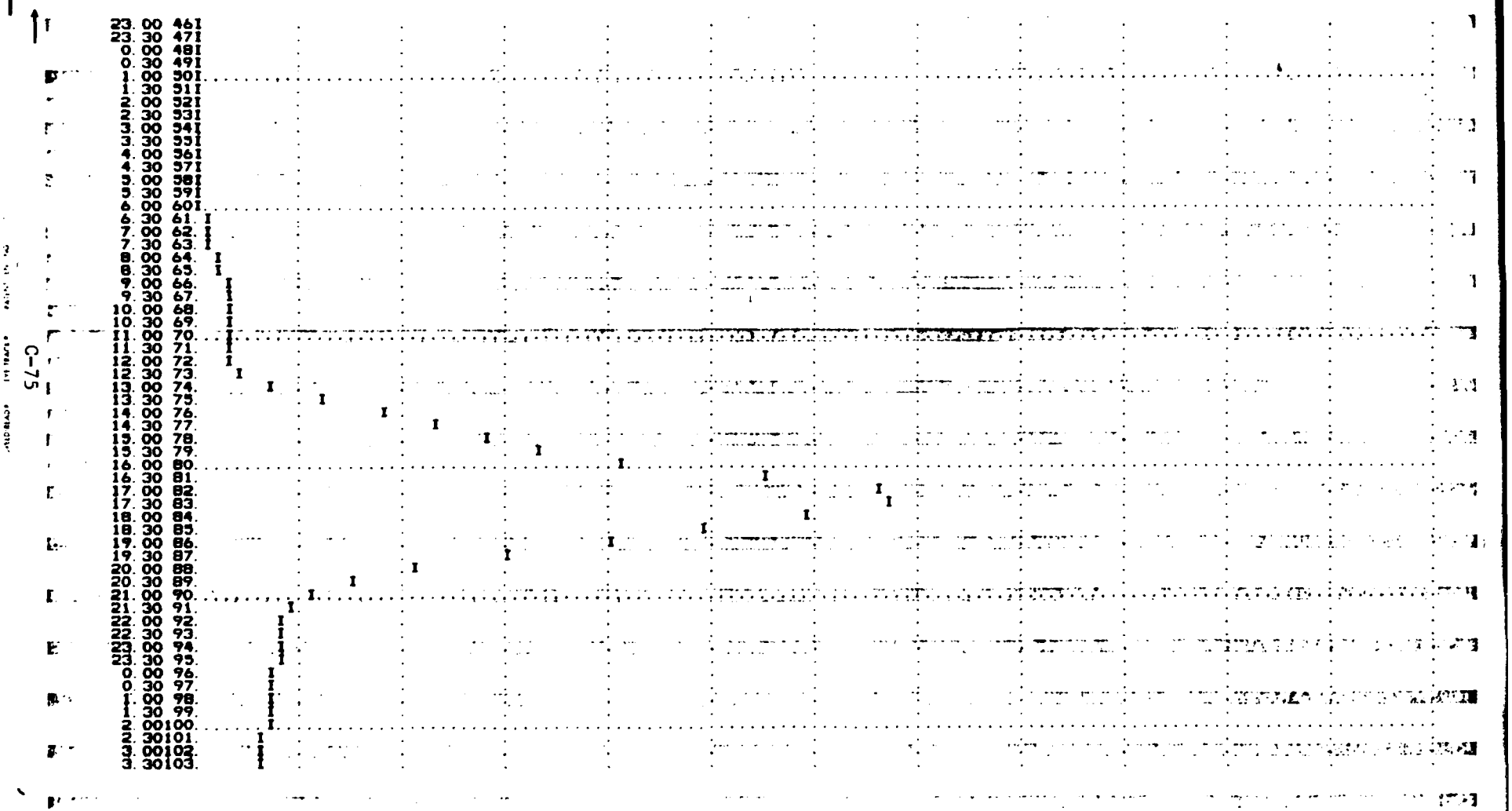
OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

0. 100. 200. 300. 400. 500. 600. 700. 0. 0. 0. 0. 0.

0.30	11	
1.00	21	
1.30	31	
2.00	41	
2.30	51	
3.00	61	
3.30	71	
4.00	81	
4.30	91	
5.00	101	
5.30	111	
6.00	121	
6.30	131	
7.00	141	
7.30	151	
8.00	161	
8.30	171	
9.00	181	
9.30	191	
10.00	201	
10.30	211	
11.00	221	
11.30	231	
12.00	241	
12.30	251	
13.00	261	
13.30	271	
14.00	281	
14.30	291	
15.00	301	
15.30	311	
16.00	321	
16.30	33. I	
17.00	34. I	
17.30	35. I	
18.00	36. I	
18.30	37. I	
19.00	38. I	
19.30	39. I	
20.00	40. I	
20.30	411	
21.00	421	
21.30	431	
22.00	441	
22.30	451	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19.30 87
20.00 88
20.30 89
21.00 90
21.30 91
22.00 92
22.30 93
23.00 94
23.30 95
0.00 96
0.30 97
1.00 98
1.30 99
2.00100
2.30101
3.00102
3.30103

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 4.30105.      I
 5.00106.      I
 5.30107.      I
 6.00108.    I
 6.30109.    I
 7.00110.    I
 7.30111.    I
 8.00112.    I
 8.30113.    I
 9.00114.    I
 9.30115.    I
10.00116.    I
10.30117.  I
11.00118.  I
11.30119.  I
12.00120.  I
```

OVN

SUM OF 2 HYDROGRAPHS AT 2 PLAN 1 RTIO 7

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	4.	13.	24.	29.	27.	23.	18.	13.	9.
6.	4.	3.	3.	3.	3.	3.	3.	3.	3.
3.	4.	5.	5.	6.	6.	6.	6.	6.	6.
8.	13.	22.	31.	38.	43.	46.	48.	49.	50.
51.	51.	65.	110.	188.	276.	357.	430.	501.	634.
847.	1018.	1028.	908.	760.	610.	457.	323.	227.	165.
131.	127.	123.	120.	117.	113.	110.	107.	105.	102.
99.	97.	94.	92.	90.	87.	85.	83.	82.	80.
78.	76.	75.	73.	71.	70.	69.	67.	66.	65.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1028.	654.	243.	103.	12333.
CMS	29.	19.	7.	3.	349.
INCHES		1.37	2.03	2.15	2.15
MM		34.72	51.54	54.57	54.57
AC-FT		324.	481.	510.	510.
THOUS CU M		400.	594.	629.	629.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

```
      0.        100.      200.      300.      400.      500.      600.      700.      800.      900.     1000.     1100.      0.
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 3.00 6I
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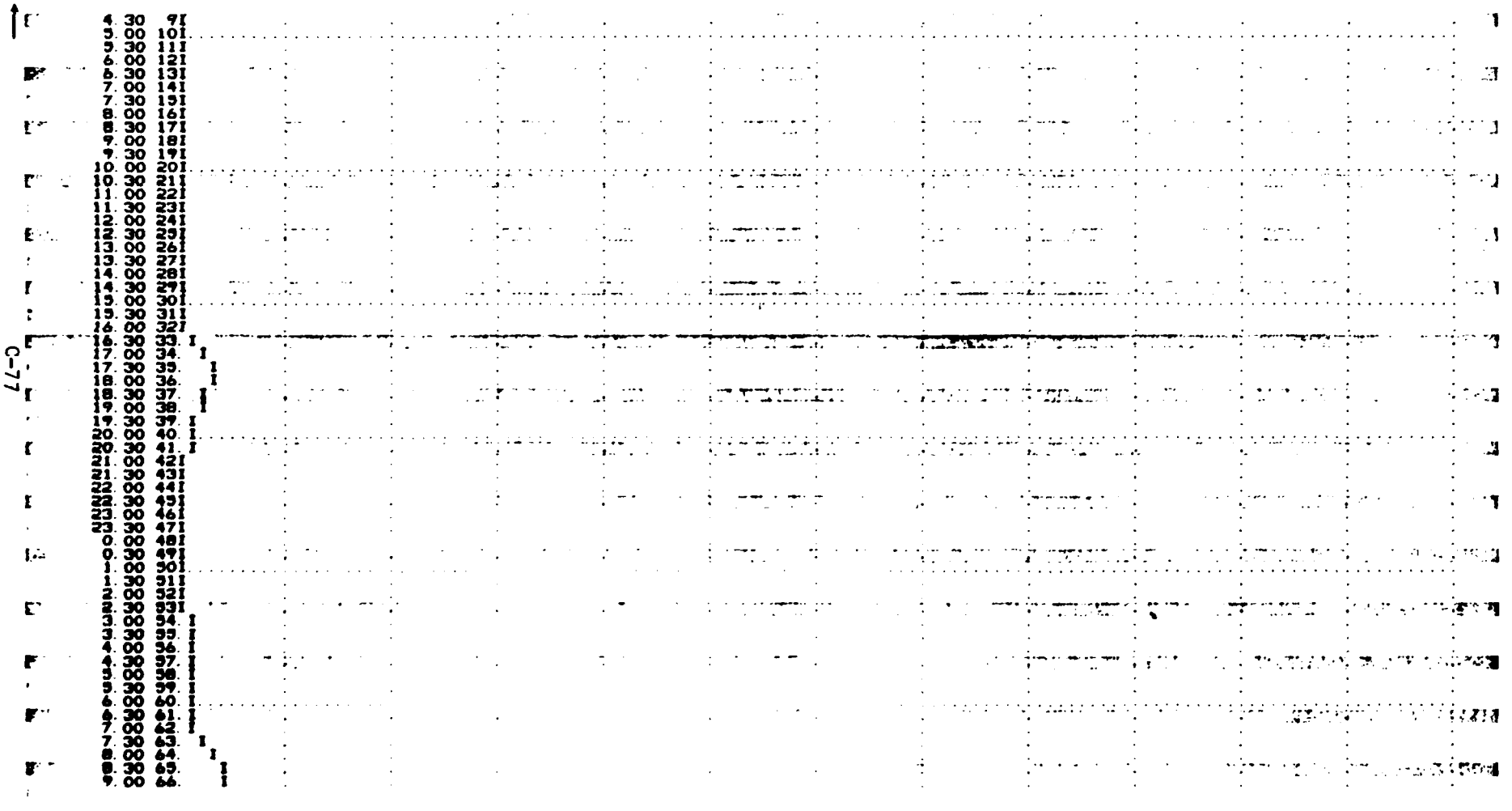
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6.00 121
6.30 131
7.00 141
7.30 151
8.00 161
8.30 171
9.00 181
9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 33
17.00 34
17.30 35
18.00 36
18.30 37
19.00 38
19.30 39
20.00 40
20.30 41
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 54
3.30 55
4.00 56
4.30 57
5.00 58
5.30 59
6.00 60
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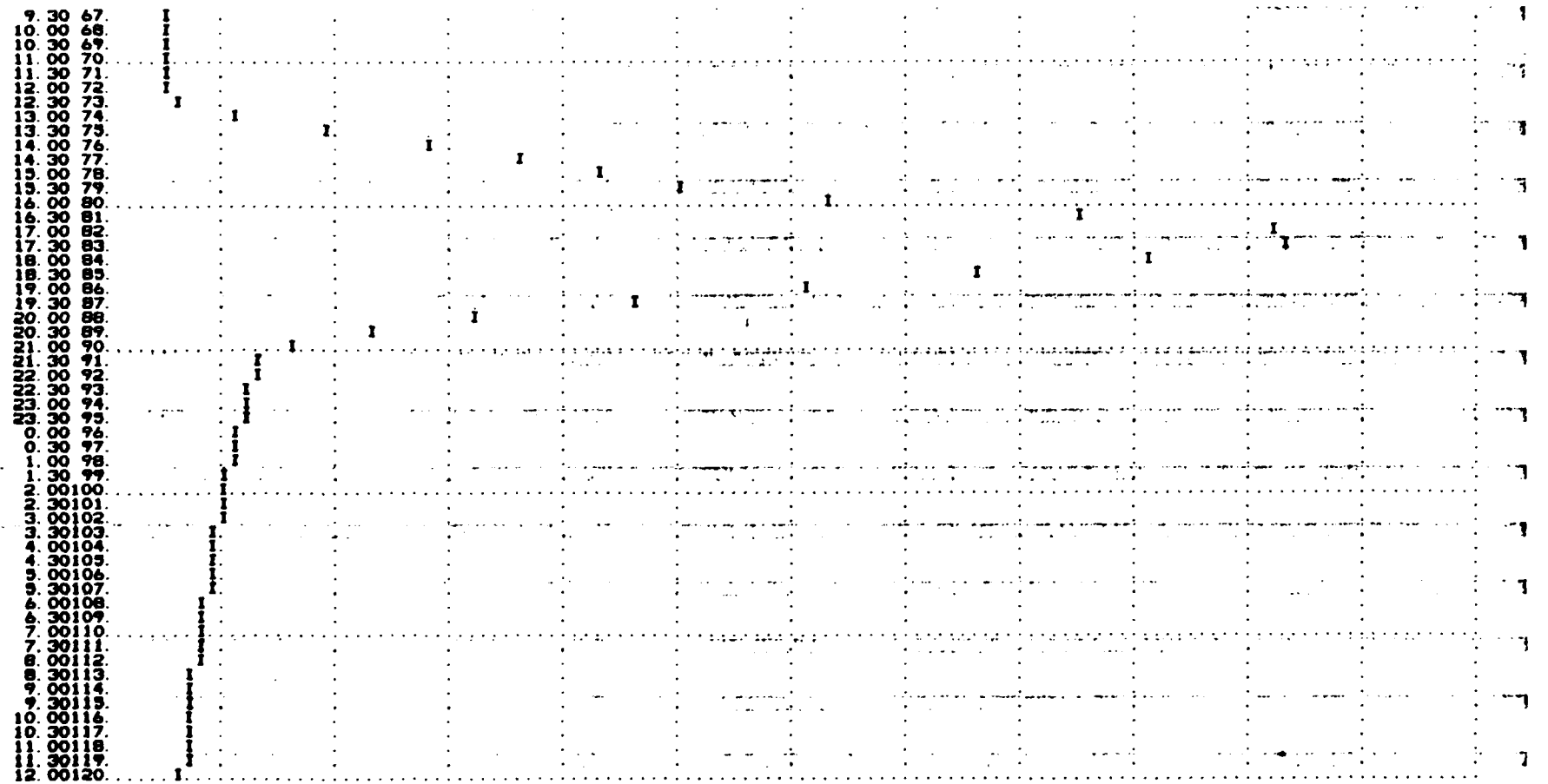
7.00 62
7.30 63
8.00 64
8.30 65
9.00 66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14. 30 77.
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16. 30 81.
17. 00 82.
17. 30 83.
18. 00 84.
18. 30 85.
19. 00 86.
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22. 00 92.
22. 30 93.
23. 00 94.
23. 30 95.
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0. 30 97.
1. 00 98.
1. 30 99.
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3. 00102.
3. 30103.
4. 00104.
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5. 30107.
6. 00108.
6. 30109.
7. 00110.
7. 30111.
8. 00112.
8. 30113.
9. 00114.
9. 30115.
10. 00116.
10. 30117.
11. 00118.
11. 30119.
12. 00120.

«OVN»

SUM OF 2 HYDROGRAPHS AT 2 PLAN 1 RTIO 8

2.	2.	2.	2.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
2.	10.	33.	59.	71.	67.	57.	45.	33.	23.
16.	11.	9.	8.	8.	8.	8.	7.	7.	7.
7.	10.	12.	13.	14.	15.	15.	15.	15.	16.
20.	33.	55.	78.	93.	107.	114.	119.	123.	125.
127.	128.	162.	276.	470.	671.	892.	1074.	1252.	1385.
2117.	2543.	2566.	2262.	1890.	1514.	1129.	792.	552.	395.
310.	301.	292.	285.	278.	272.	266.	260.	254.	249.
243.	238.	233.	228.	223.	219.	214.	209.	205.	201.
197.	193.	189.	185.	181.	178.	174.	171.	168.	165.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2566.	1630.	603.	255.	30639.
CMS	73.	46.	17.	7.	868.
INCHES		3.41	5.04	5.34	5.34
MM		86.57	127.97	135.57	135.57
AC-FT		808.	1195.	1266.	1266.
THOUS CU M		997.	1474.	1562.	1562.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

		0.	400.	800.	1200.	1600.	2000.	2400.	2800.	0.	0.	0.	0.	0.
0.30	11													
1.00	21													
1.30	31													
2.00	41													
2.30	51													
3.00	61													
3.30	71													
4.00	81													
4.30	91													
5.00	101													
5.30	111													
6.00	121													
6.30	131													
7.00	141													
7.30	151													
8.00	161													
8.30	171													
9.00	181													
9.30	191													
10.00	201													
10.30	211													
11.00	221													
11.30	231													
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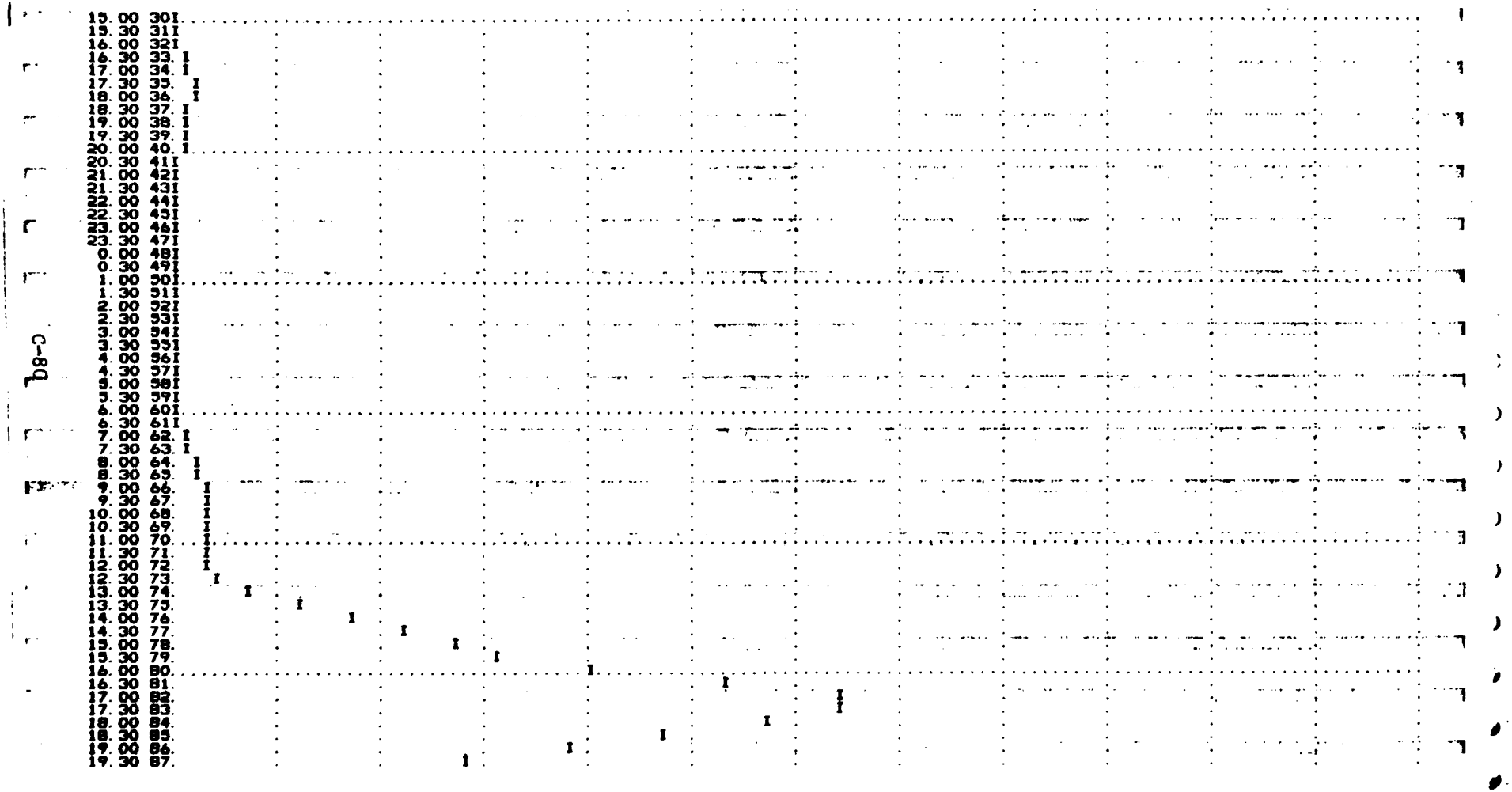
12.30	251													
13.00	261													
13.30	271													
14.00	281													
14.30	291													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20.00 40.
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
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7.30 63.
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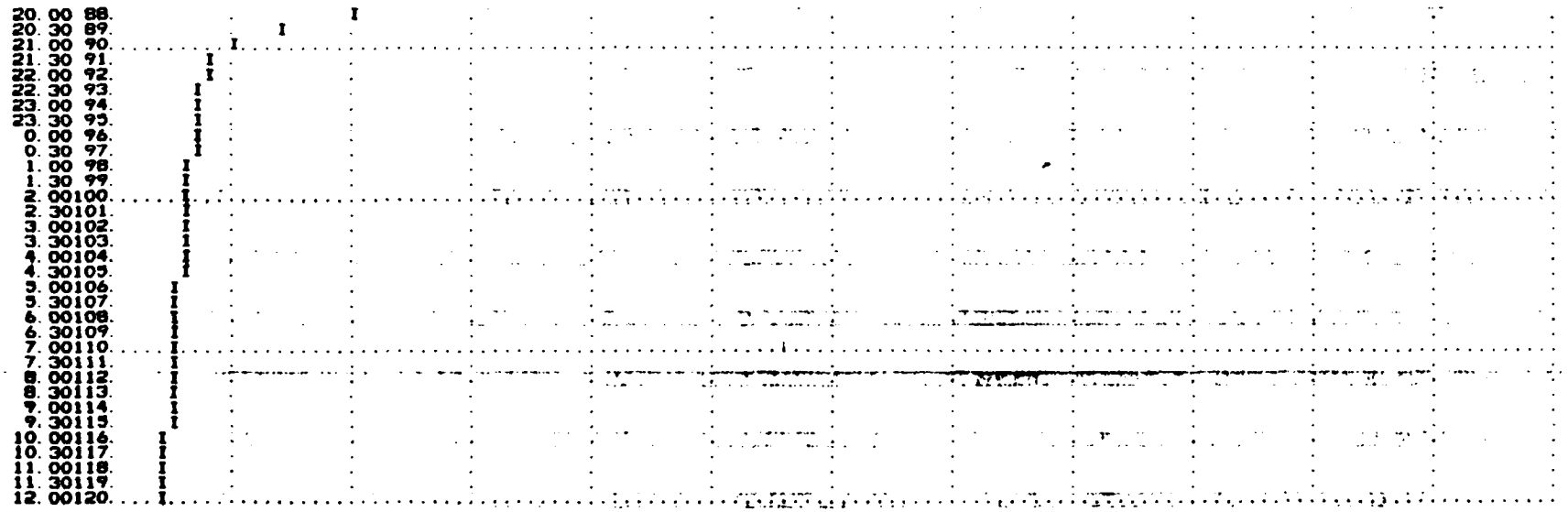

OVN

SUM OF 2 HYDROGRAPHS AT 2 PLAN 1 RTIO 9

4.	4.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	3.	3.	3.
3.	21.	67.	119.	143.	135.	114.	90.	66.	46.
31.	22.	17.	17.	16.	16.	15.	15.	14.	14.
14.	19.	23.	26.	28.	29.	30.	31.	31.	31.
39.	66.	111.	156.	191.	213.	228.	238.	245.	250.
253.	256.	323.	551.	940.	1381.	1784.	2148.	2502.	3165.
4226.	5072.	5138.	4560.	3835.	3099.	2333.	1664.	1185.	875.
706.	688.	671.	654.	638.	622.	607.	593.	579.	565.
552.	540.	528.	516.	505.	494.	484.	474.	464.	455.
446.	438.	429.	421.	414.	406.	399.	392.	385.	379.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5138.	3282.	1253.	530.	63398.
CMS	145.	93.	35.	15.	1801.
INCHES		6.86	10.48	11.08	11.08
MM		174.25	266.19	281.40	281.40

AC-FT	1627.	2486.	2628.	2628.
THOUS CU M	2007.	3066.	3242.	3242.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

0. 500. 1000. 1500. 2000. 2500. 3000. 3500. 4000. 4500. 5000. 5500. 0.

0.	30	11
1.	00	21
1.	30	31
2.	00	41
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3.	00	61
3.	30	71
4.	00	81
4.	30	91
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8.	30	171
9.	00	181
9.	30	191
10.	00	201
10.	30	211
11.	00	221
11.	30	231
12.	00	241
12.	30	251
13.	00	261
13.	30	271
14.	00	281
14.	30	291
15.	00	301
15.	30	311
16.	00	321
16.	30	33. I
17.	00	34. I
17.	30	35. I
18.	00	36. I
18.	30	37. I
19.	00	38. I
19.	30	39. I
20.	00	40. I
20.	30	41. I
21.	00	421
21.	30	431
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22.	30	451
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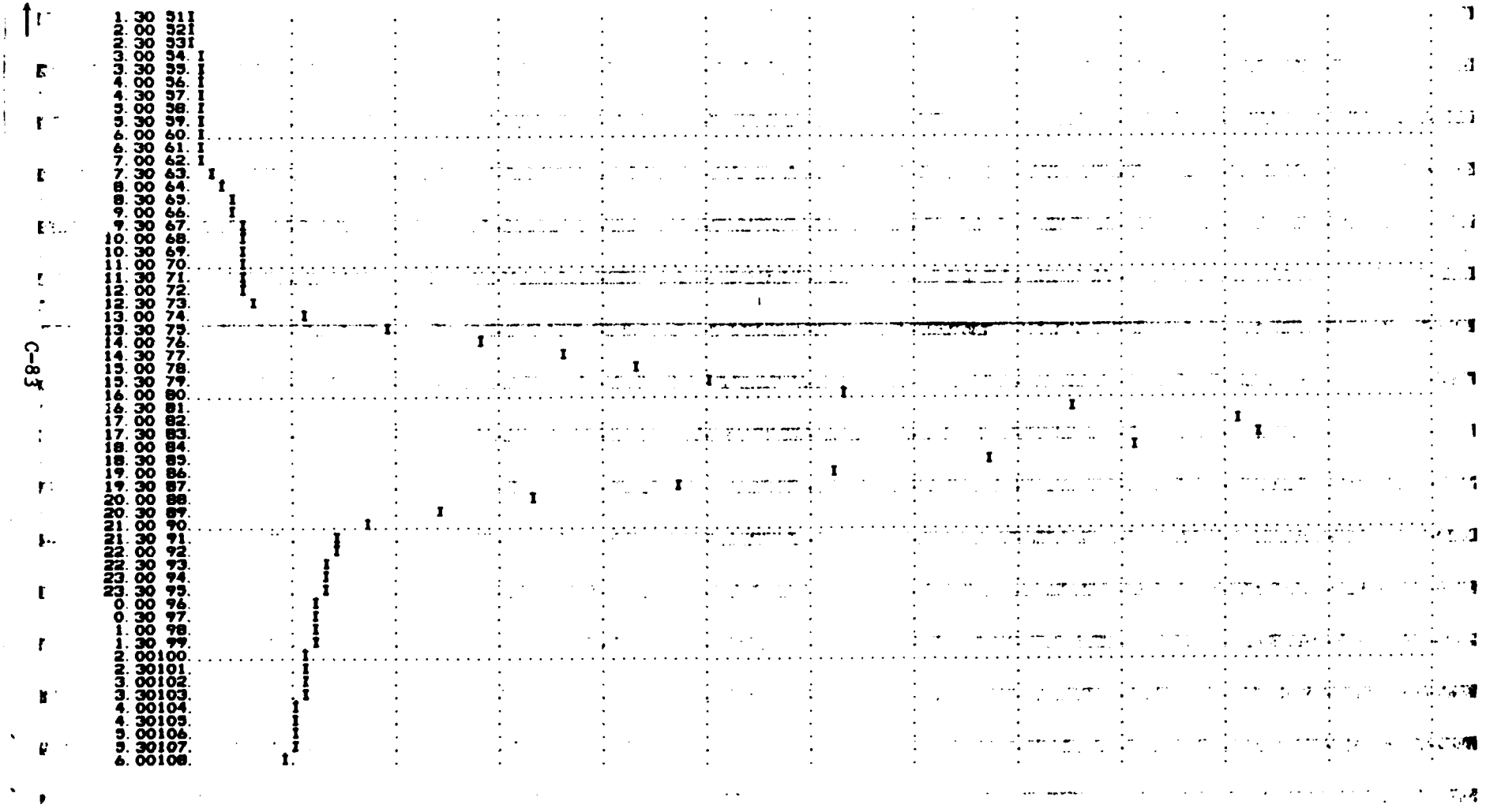
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13.00 74.
13.30 75.
14.00 76.
14.30 77.
15.00 78.
15.30 79.
16.00 80.
16.30 81.
17.00 82.
17.30 83.
18.00 84.
18.30 85.
19.00 86.
19.30 87.
20.00 88.
20.30 89.
21.00 90.
21.30 91.
22.00 92.
22.30 93.
23.00 94.
23.30 95.
0.00 96.
0.30 97.
1.00 98.
1.30 99.
2.00100.
2.30101.
3.00102.
3.30103.
4.00104.
4.30105.
5.00106.
5.30107.
6.00108.

C-83

```
 6.30109.      I.
 7.00110.      I.
 7.30111.      I.
 8.00112.      I.
 8.30113.      I.
 9.00114.      I
 9.30115.      I
10.00116.      I
10.30117.      I
11.00118.      I
11.30119.      I
12.00120.      I

*OVN*

**********    **********    **********    **********    **********
                        HYDROGRAPH ROUTING

 LAKE MUSKODAY ROUTING - MODIFIED PULS METHOD
                ISTAQ   ICOMP   IECON   ITAPE   JPLT    JPRT   INAME  ISTAGE  IAUTO
                    2       1       0       0      0       0       1       0      0
                                ROUTING DATA
              GLOSS   CLOSS     AVG   IRES   ISAME   IOPT    IPMP          LSTR
                0.0   0.000    0.00      1       1      0       0             0

              NSTPS   NSTDL     LAG  AMSKK      X     TSK   STORA  ISPRAT
                  1       0       0  0.000  0.000   0.000      0.      -1

 STAGE   1843.00  1843.50  1844.00  1844.50  1844.70  1844.75  1845.20  1845.60  1846.00  1847.00
         1848.00  1849.00  1850.00

 FLOW       0.00    18.50    52.20    95.90   104.00   135.20   165.50   188.90   208.90   252.90
          290.30   323.80   353.40

 SURFACE AREA=       50.      96.     154.
 CAPACITY=            0.    1219.    3704.
 ELEVATION=        1843.    1860.    1880.
                    CREL    SPWID    COGW    EXPW    ELEVL    COGL    CAREA    EXPL
                 1843.0      0.0     0.0     0.0      0.0     0.0      0.0     0.0
                                DAM DATA
                           TOPEL    COGD    EXPD  DAMWID
                          1845.6     2.5     1.5    140.

                STATION      2, PLAN 1, RATIO 1
              END-OF-PERIOD HYDROGRAPH ORDINATES
                                OUTFLOW
          0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	2.	2.	2.	2.	3.	3.
3.	3.	4.	4.	5.	7.	9.	12.	15.	19.
28.	38.	50.	62.	72.	78.	82.	83.	82.	80.
77.	74.	71.	69.	66.	64.	61.	59.	57.	55.
53.	51.	50.	48.	47.	46.	44.	43.	42.	41.
40.	39.	38.	37.	36.	35.	34.	33.	32.	31.

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	2.	2.	2.	3.	3.	4.	4.
4.	3.	3.	6.	7.	9.	12.	16.	20.	23.
32.	40.	49.	57.	62.	66.	69.	69.	69.	67.
66.	64.	62.	61.	59.	58.	56.	55.	53.	52.
51.	50.	49.	48.	47.	46.	45.	44.	43.	42.
41.	40.	40.	39.	38.	37.	37.	36.	35.	35.

STAGE

1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.1	1843.1	1843.1	1843.1
1843.1	1843.1	1843.1	1843.1	1843.1	1843.2	1843.2	1843.3	1843.4	1843.5
1843.6	1843.8	1844.0	1844.1	1844.2	1844.3	1844.3	1844.4	1844.3	1844.3
1844.3	1844.3	1844.2	1844.2	1844.2	1844.1	1844.1	1844.1	1844.1	1844.0
1844.0	1844.0	1844.0	1843.9	1843.9	1843.9	1843.9	1843.9	1843.8	1843.8
1843.8	1843.8	1843.8	1843.8	1843.8	1843.7	1843.7	1843.7	1843.7	1843.7

PEAK OUTFLOW IS 83. AT TIME 44.00 HOURS

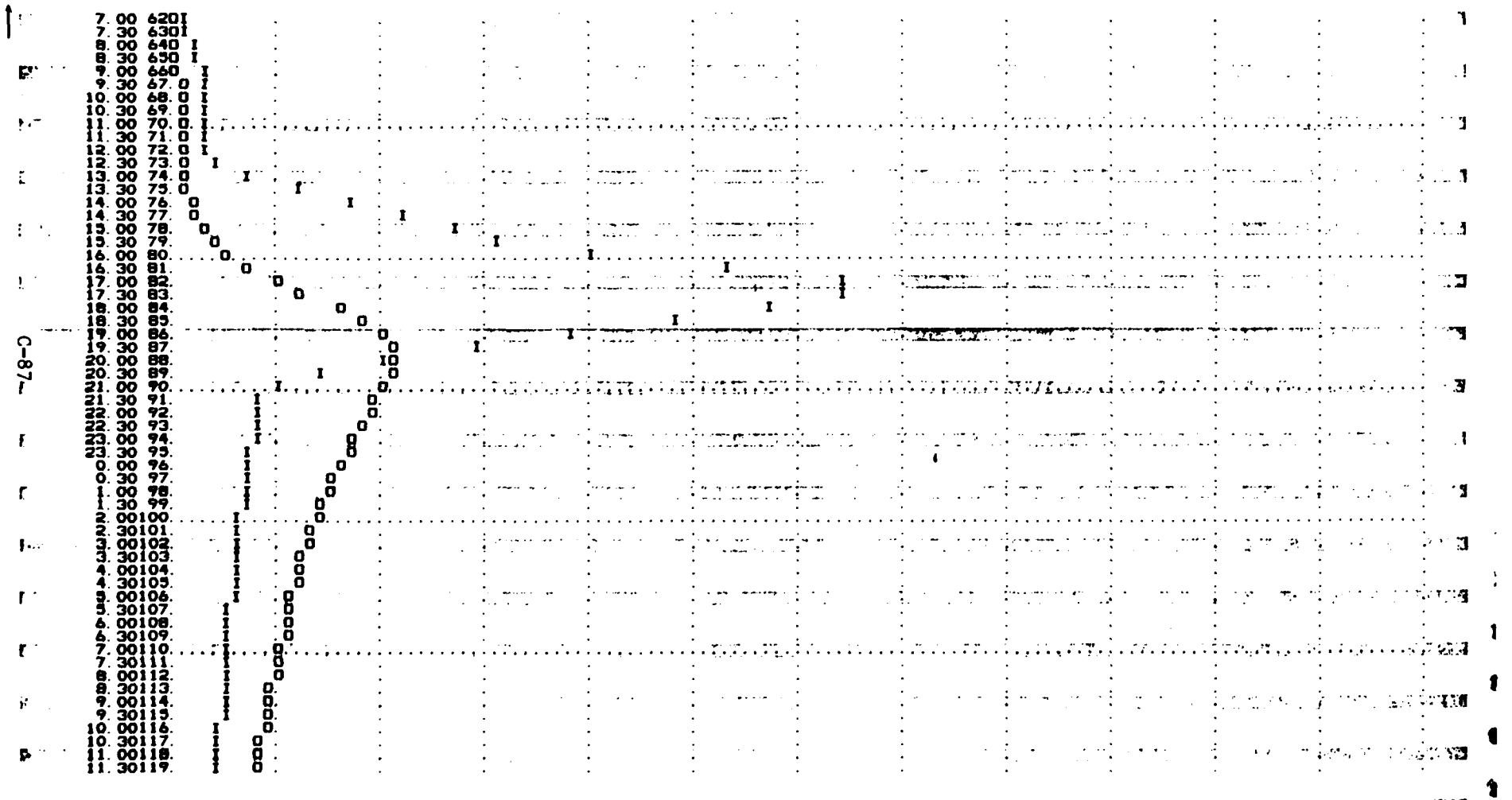
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	83.	75.	46.	19.	2235.
CMS	2.	2.	1.	1.	63.
INCHES		0.16	0.38	0.39	0.39
MM		3.97	9.68	9.89	9.89
AC-FT		37.	90.	92.	92.
THOUS CU M		46.	112.	114.	114.

OVF

STATION 2

```
                     INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
       0.      40.     80.     120.    160.    200.    240.    280.    0.    0.    0.    0.    0.
0.30   1I       .       .       .       .       .       .       .       .     .     .     .     .
1.00   2I       .       .       .       .       .       .       .       .     .     .     .     .
1.30   3I       .       .       .       .       .       .       .       .     .     .     .     .
```

2.00 41
2.30 51
3.00 61
3.30 71
4.00 81
4.30 91
5.00 101
5.30 111
6.00 121
6.30 131
7.00 141
7.30 151
8.00 161
8.30 171
9.00 181
9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 3301
17.00 3401
17.30 350
18.00 360
18.30 3701
19.00 3801
19.30 3901
20.00 4001
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611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7.30 630
8.00 640
8.30 650
9.00 660
9.30 67.0
10.00 68.0
10.30 69.0
11.00 70.0
11.30 71.0
12.00 72.0
12.30 73.0
13.00 74.0
13.30 75.0
14.00 76.0
14.30 77.0
15.00 78.0
15.30 79.0
16.00 80.0
16.30 81.0
17.00 82.0
17.30 83.0
18.00 84.0
18.30 85.0
19.00 86.0
19.30 87.0
20.00 88.0
20.30 89.0
21.00 90.0
21.30 91.0
22.00 92.0
22.30 93.0
23.00 94.0
23.30 95.0
0.00 96.0
0.30 97.0
1.00 98.0
1.30 99.0
2.00100.0
2.30101.0
3.00102.0
3.30103.0
4.00104.0
4.30105.0
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7.30111.0
8.00112.0
8.30113.0
9.00114.0
9.30115.0
10.00116.0
10.30117.0
11.00118.0
11.30119.0

12.00120....I...O.....

OVN

STATION 2, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	2.	3.	3.	4.	5.	5.	5.
6.	6.	7.	8.	10.	13.	16.	23.	33.	45.
62.	86.	103.	146.	157.	165.	168.	168.	167.	163.
158.	153.	148.	144.	139.	131.	104.	102.	100.	99.
97.	95.	92.	88.	85.	82.	79.	77.	74.	72.
69.	67.	65.	63.	61.	59.	57.	55.	53.	52.

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	2.	2.	2.	2.
3.	3.	3.	3.	3.	2.	2.	2.	2.	3.
3.	2.	2.	2.	2.	2.	2.	2.	2.	2.
3.	3.	3.	3.	4.	4.	5.	6.	6.	7.
8.	9.	9.	11.	13.	17.	22.	29.	36.	45.
57.	71.	86.	99.	108.	114.	117.	118.	116.	113.
109.	105.	101.	97.	93.	90.	87.	85.	83.	81.
79.	76.	74.	72.	71.	69.	67.	65.	64.	62.
61.	60.	58.	57.	56.	55.	54.	52.	52.	51.

STAGE

1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.1
1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.1	1843.1
1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1
1843.2	1843.2	1843.2	1843.2	1843.3	1843.3	1843.4	1843.6	1843.7	1843.9
1844.1	1844.4	1844.7	1844.9	1845.1	1845.2	1845.2	1845.3	1845.2	1845.2
1845.1	1845.0	1844.9	1844.9	1844.8	1844.7	1844.7	1844.7	1844.6	1844.6
1844.5	1844.3	1844.4	1844.4	1844.4	1844.3	1844.3	1844.3	1844.2	1844.2
1844.2	1844.2	1844.1	1844.1	1844.1	1844.1	1844.1	1844.0	1844.0	1844.0

PEAK OUTFLOW IS 168. AT TIME 44.00 HOURS

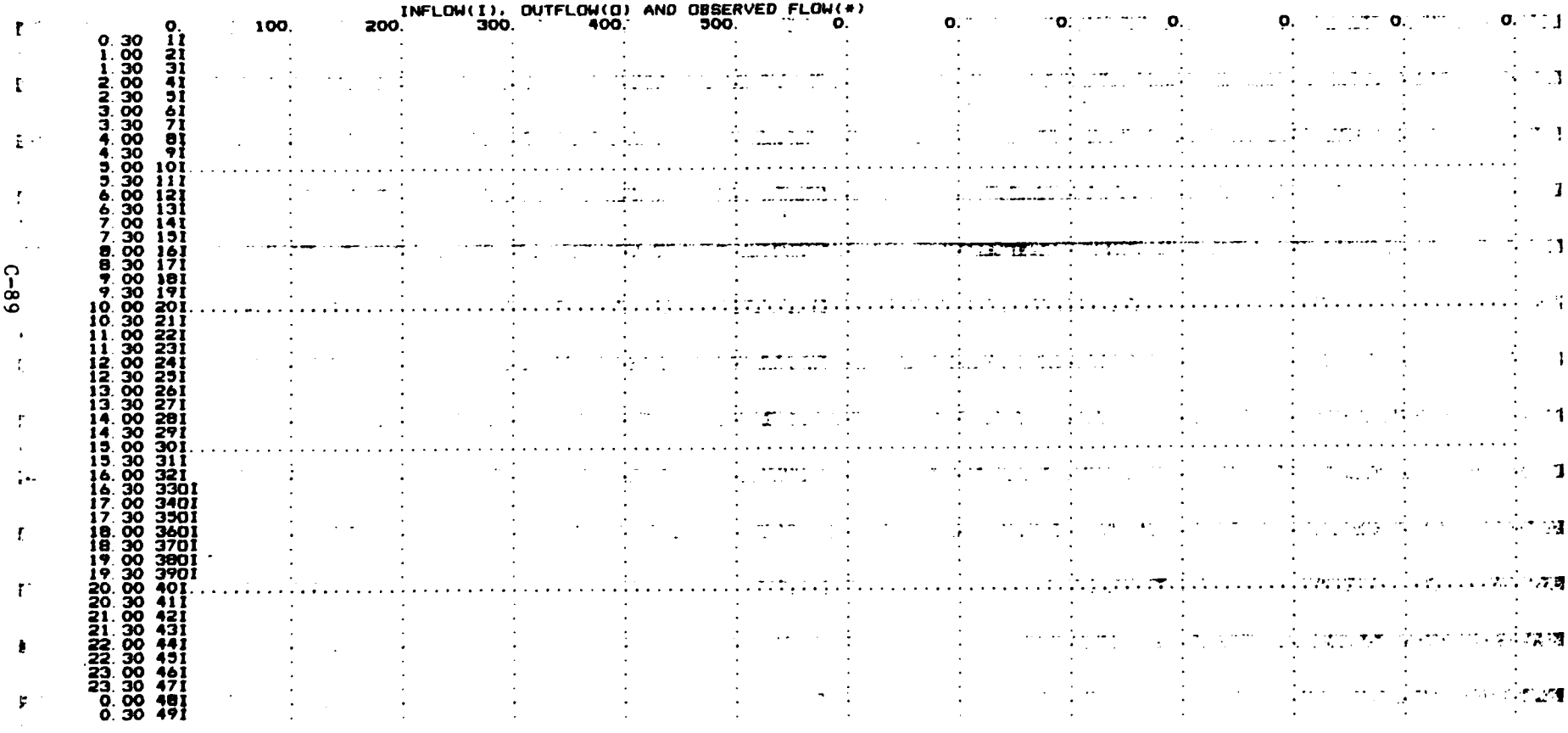
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	168.	156.	88.	36.	4325.
CMS	5.	4.	2.	1.	122.
INCHES		0.33	0.74	0.75	0.75

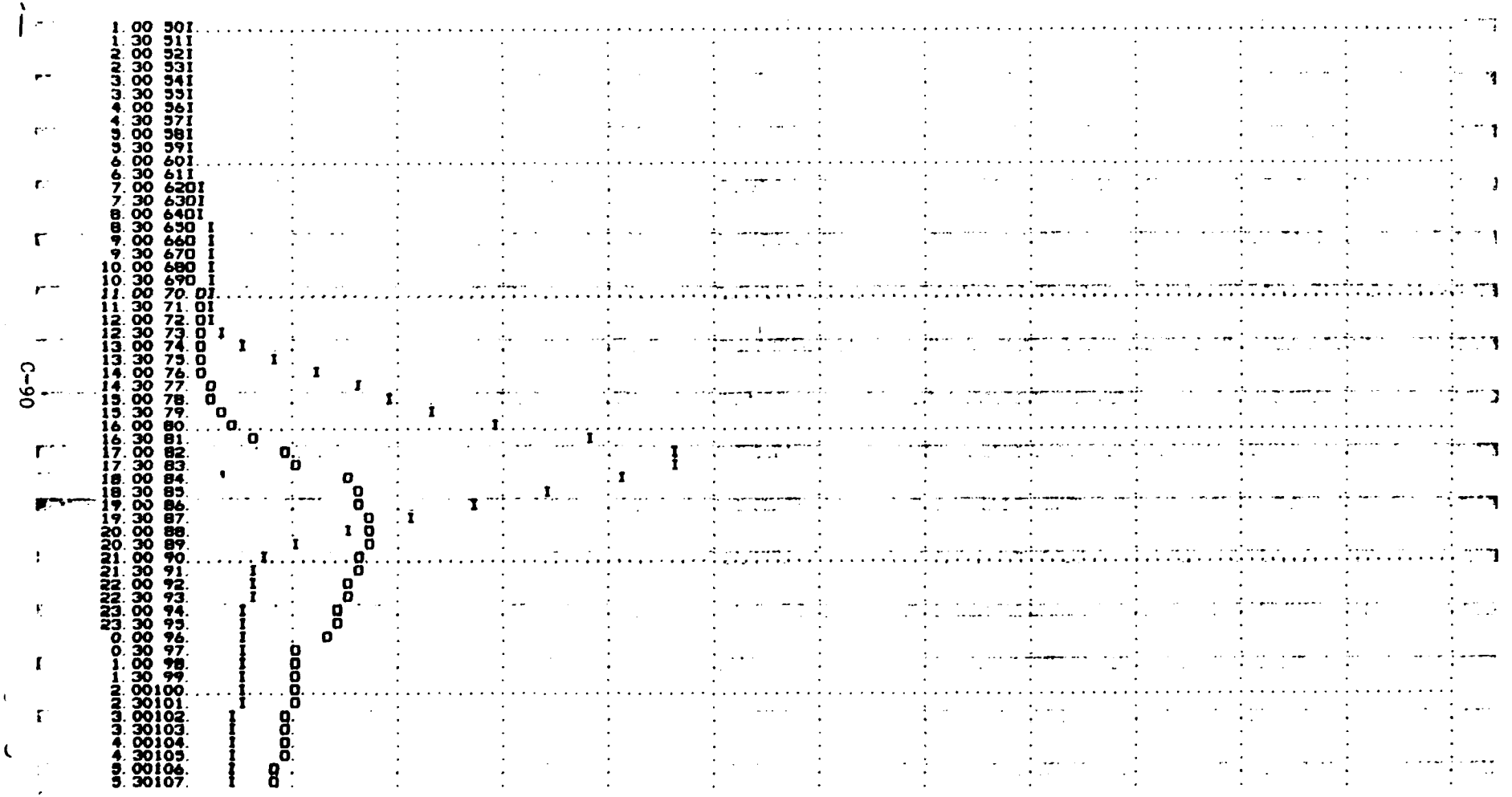
MM	8.27	18.74	19.14	19.14	
AC-FT	77.	175.	179.	179.	
THOUS CU M	95.	216.	220.	220.	

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)




1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 6201
7.30 6301
8.00 6401
8.30 650 I
9.00 660 I
9.30 670 I
10.00 680 I
10.30 690 I
11.00 70.01
11.30 71.01
12.00 72.01
12.30 73.0 I
13.00 74.0
13.30 75.0
14.00 76.0
14.30 77.
15.00 78.
15.30 79.
16.00 80.
16.30 81.
17.00 82.
17.30 83.
18.00 84.
18.30 85.
19.00 86.
19.30 87.
20.00 88.
20.30 89.
21.00 90.
21.30 91.
22.00 92.
22.30 93.
23.00 94.
23.30 95.
0.00 96.
0.30 97.
1.00 98.
1.30 99.
2.00100.
2.30101.
3.00102.
3.30103.
4.00104.
4.30105.
5.00106.
5.30107.

```
 6.00108.   I    0
 6.30109.   I   0
 7.00110.   I  0
 7.30111.   I  0
 8.00112.   I    0
 8.30113.   I  0
 9.00114.   I  0
 9.30115.   I  0
10.00116.   I  0
10.30117.   I  0
11.00118.   I  0
11.30119.   I 0
12.00120.   I 0
```

#OVN#

STATION 2, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	2.	2.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	2.	3.	3.	4.	5.	5.	6.	
7.	7.	8.	9.	11.	14.	18.	27.	38.	51.
72.	97.	141.	158.	170.	177.	181.	182.	180.	176.
172.	168.	163.	158.	153.	148.	143.	139.	130.	104.
102.	100.	99.	97.	95.	92.	89.	86.	83.	80.
77.	75.	72.	70.	68.	66.	64.	62.	60.	58.

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	2.	2.	2.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	4.	4.	5.	6.	6.	7.	8.
9.	10.	10.	12.	15.	19.	25.	32.	40.	50.
63.	78.	95.	109.	119.	126.	130.	130.	128.	125.
121.	117.	112.	108.	104.	101.	97.	93.	90.	87.
85.	83.	81.	79.	77.	75.	73.	71.	69.	67.
66.	64.	63.	61.	60.	59.	58.	56.	55.	54.

STAGE

1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.1	1843.1
1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1
1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1
1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.2

1843.2	1843.2	1843.2	1843.2	1843.3	1843.4	1843.5	1843.6	1843.8	1844.0
1844.2	1844.5	1844.8	1845.1	1845.3	1845.4	1845.5	1845.5	1845.4	1845.4
1845.3	1845.2	1845.2	1845.1	1845.0	1844.9	1844.9	1844.8	1844.7	1844.7
1844.7	1844.6	1844.6	1844.5	1844.5	1844.5	1844.4	1844.4	1844.3	1844.3
1844.3	1844.3	1844.2	1844.2	1844.2	1844.2	1844.1	1844.1	1844.1	1844.1

PEAK OUTFLOW IS 182. AT TIME 44.00 HOURS

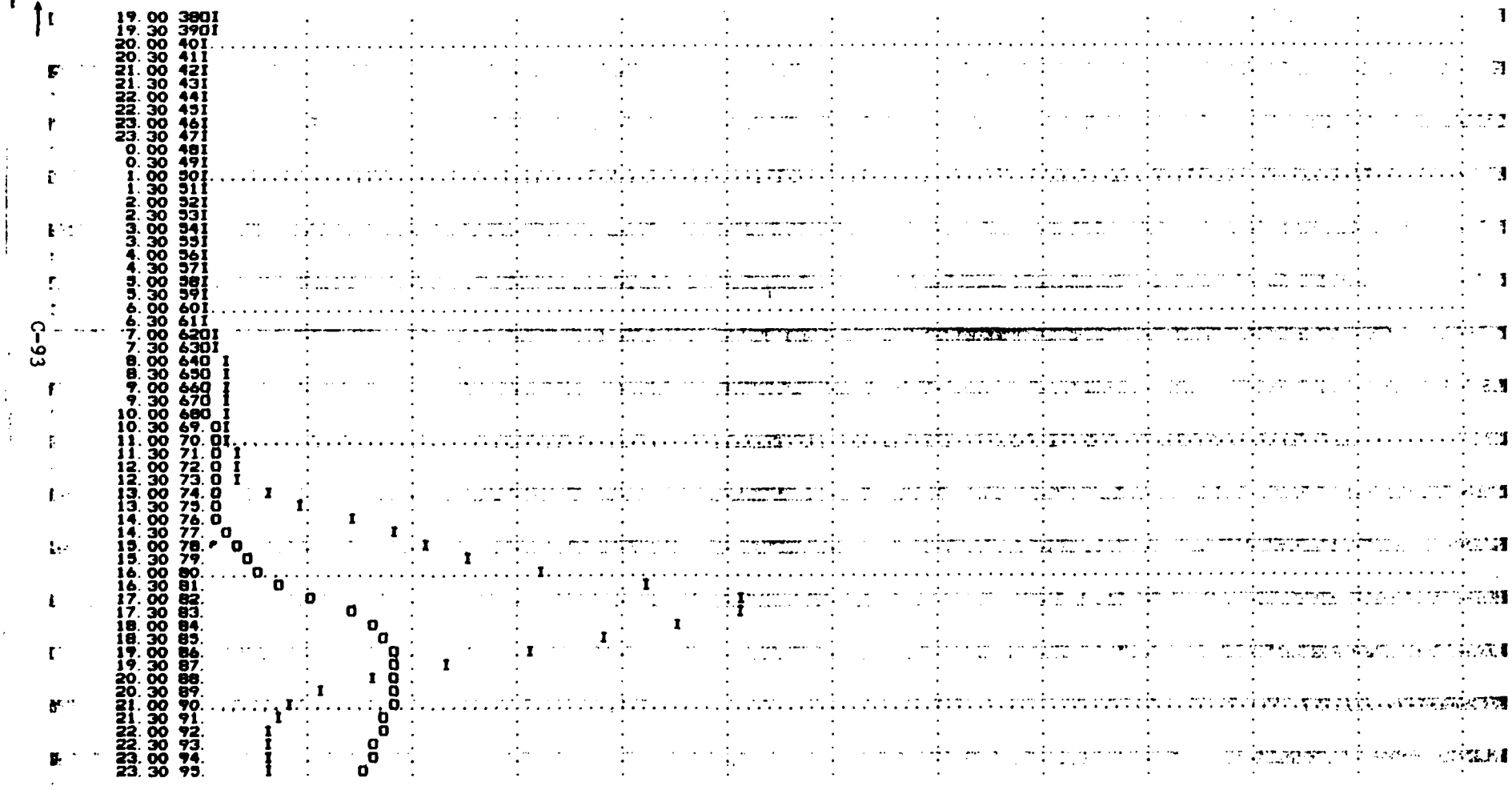
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	182.	169.	99.	40.	4853.
CMS	5.	5.	3.	1.	137.
INCHES		0.35	0.83	0.85	0.85
MM		8.99	21.04	21.47	21.47
AC-FT		84.	196.	201.	201.
THOUS CU M		104.	242.	247.	247.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

	0.	100.	200.	300.	400.	500.	600.	0.	0.	0.	0.	0.	0.
0.30	11												
1.00	21												
1.30	31												
2.00	41												
2.30	51												
3.00	61												
3.30	71												
4.00	81												
4.30	91												
5.00	101												
5.30	111												
6.00	121												
6.30	131												
7.00	141												
7.30	151												
8.00	161												
8.30	171												
9.00	181												
9.30	191												
10.00	201												
10.30	211												
11.00	221												
11.30	231												
12.00	241												
12.30	251												
13.00	261												
13.30	271												
14.00	281												
14.30	291												
15.00	301												
15.30	311												
16.00	321												
16.30	3301												
17.00	3401												
17.30	3501												
18.00	3601												
18.30	3701												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19.30 390I
20.00 401
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 6201
7.30 6301
8.00 640 I
8.30 650 I
9.00 660 I
9.30 670 I
10.00 680 I
10.30 69.0I
11.00 70.0I
11.30 71.0 I
12.00 72.0 I
12.30 73.0 I
13.00 74.0 I
13.30 75.0 I
14.00 76.0 I
14.30 77.0 I
15.00 78.0 I
15.30 79.0 I
16.00 80.0 I
16.30 81.0 I
17.00 82.0 I
17.30 83.0 I
18.00 84.0 I
18.30 85.0 I
19.00 86.0 I
19.30 87.0 I
20.00 88.0 I
20.30 89.0 I
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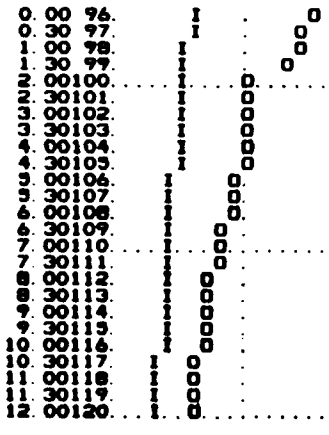
21.30 91.I 0
22.00 92.I 0
22.30 93.I 0
23.00 94.I 0
23.30 95.I 0

C-93



OVN

STATION 2, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	1	1	1	2	2	2	2
2	2	2	2	2	2	2	2	2	2
2	2	3	3	3	4	5	5	6	7
9	10	12	15	21	32	43	39		
[illegible]	[illegible]	152	170	182	193	206	207	199	189
[illegible]	[illegible]	179	171	166	161	156	151	147	142
[illegible]	[illegible]	103	102	100	99	97	95	92	89
[illegible]	[illegible]	80	78	75	73	70	68	66	64

STORAGE

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	1	2	2	3	3	3	3
3	3	3	3	3	3	3	3	3	3
3	3	4	4	5	5	6	7	8	9
10	11	11	13	16	21	27	35	44	39
89	86	104	119	131	139	143	143	141	137

	133.	128.	124.	120.	115.	111.	107.	103.	100.	96.
	92.	89.	87.	85.	83.	81.	78.	76.	74.	73.
	71.	69.	67.	66.	64.	63.	62.	60.	59.	58.
STAGE										
	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.1	1843.1	1843.1
	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1
	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1
	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.2	1843.2
	1843.2	1843.2	1843.2	1843.3	1843.3	1843.4	1843.5	1843.7	1843.9	1844.1
	1844.3	1844.7	1845.0	1845.3	1845.5	1845.6	1845.7	1845.7	1845.7	1845.6
	1845.5	1845.4	1845.4	1845.3	1845.2	1845.1	1845.1	1845.0	1844.9	1844.9
	1844.8	1844.7	1844.7	1844.6	1844.6	1844.6	1844.5	1844.5	1844.5	1844.4
	1844.4	1844.4	1844.3	1844.3	1844.3	1844.2	1844.2	1844.2	1844.2	1844.1

PEAK OUTFLOW IS 207. AT TIME 44.00 HOURS

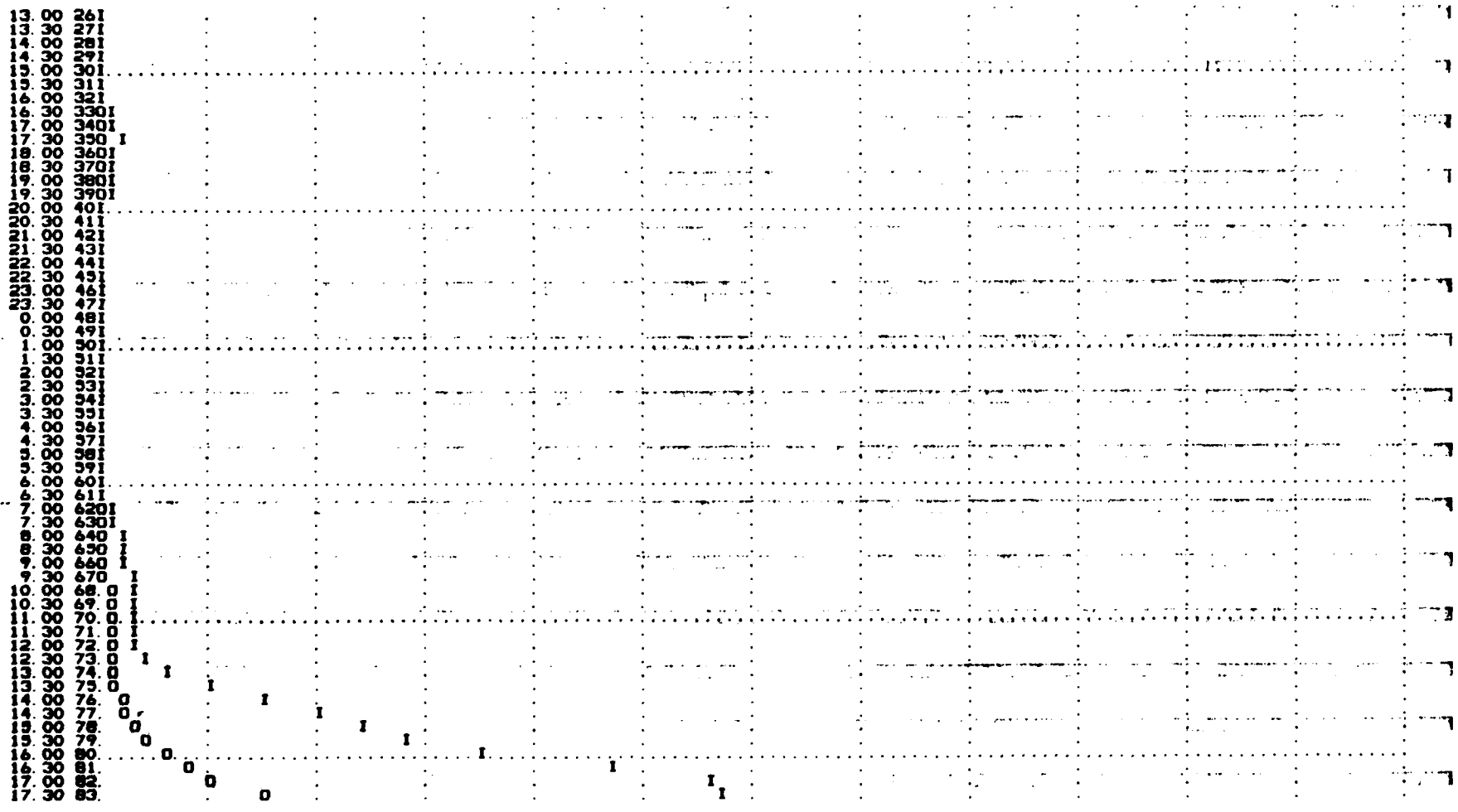
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	207.	185.	110.	49.	5379.
CMS	6.	5.	3.	1.	152.
INCHES		0.39	0.92	0.94	0.94
MM		9.81	23.32	23.80	23.80
AC-FT		92.	218.	222.	222.
THOUS CU M		113.	269.	274.	274.

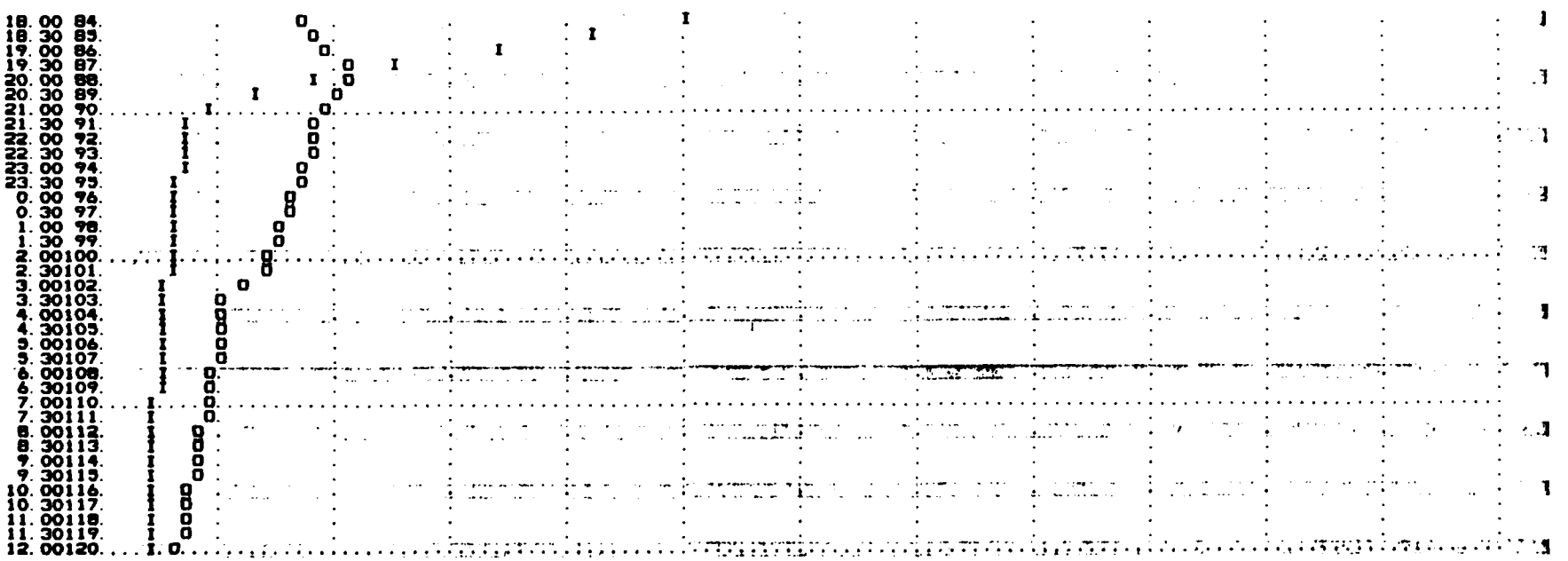
OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

	0.	100.	200.	300.	400.	500.	600.	0.	0.	0.	0.	0.	0.
0.30	11												
1.00	21												
1.30	31												
2.00	41												
2.30	51												
3.00	61												
3.30	71												
4.00	81												
4.30	91												
5.00	101												
5.30	111												
6.00	121												
6.30	131												
7.00	141												
7.30	151												
8.00	161												
8.30	171												
9.00	181												
9.30	191												
10.00	201												
10.30	211												
11.00	221												
11.30	231												
12.00	241												
12.30	251												


13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 3301
17.00 3401
17.30 350 I
18.00 3601
18.30 3701
19.00 3801
19.30 3901
20.00 401
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 6201
7.30 6301
8.00 640 I
8.30 650 I
9.00 660 I
9.30 670 I
10.00 68.0 I
10.30 69.0 I
11.00 70.0 I
11.30 71.0 I
12.00 72.0 I
12.30 73.0 I
13.00 74.0 I
13.30 75.0 I
14.00 76. 0 I
14.30 77. 0 I
15.00 78. 0 I
15.30 79. 0 I
16.00 80. 0 I
16.30 81. 0 I
17.00 82. 0 I
17.30 83. 0 I



OVN

STATION 2, PLAN 1, RATIO 5

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	0.	0.	0.	1.	1.	1.	2.	2.	2.	2.
	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
	3.	3.	3.	3.	4.	4.	5.	6.	6.	7.
	9.	9.	9.	11.	13.	17.	24.	36.	48.	67.
	92.	138.	162.	180.	202.	238.	255.	251.	233.	213.
	179.	187.	182.	177.	173.	169.	164.	159.	154.	150.
	145.	141.	137.	116.	103.	102.	100.	99.	97.	95.

	92.	89.	86.	83.	81.	78.	76.	73.	71.	69.
STORAGE										
	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	0.	0.	0.	1.	1.	2.	3.	3.	3.	3.
	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
	3.	4.	4.	4.	5.	6.	7.	8.	9.	10.
	11.	11.	13.	14.	17.	23.	30.	38.	48.	60.
	75.	93.	112.	129.	142.	150.	153.	152.	149.	144.
	140.	139.	130.	126.	122.	118.	114.	110.	106.	102.
	98.	95.	92.	89.	86.	84.	82.	80.	78.	77.
	75.	73.	71.	69.	68.	66.	65.	63.	62.	61.
STAGE										
	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.1	1843.1	1843.1	1843.1
	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.1	1843.1	1843.1	1843.1
	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1
	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.2	1843.2	1843.2
	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.2	1843.2	1843.2
	1843.2	1843.2	1843.3	1843.3	1843.3	1843.5	1843.6	1843.8	1843.9	1844.2
	1844.5	1844.8	1845.2	1845.5	1845.7	1845.8	1845.9	1845.9	1845.8	1845.7
	1845.6	1845.6	1845.5	1845.4	1845.3	1845.3	1845.2	1845.1	1845.0	1845.0
	1844.9	1844.8	1844.8	1844.7	1844.7	1844.6	1844.6	1844.6	1844.5	1844.5
	1844.5	1844.4	1844.4	1844.4	1844.3	1844.3	1844.3	1844.2	1844.2	1844.2

PEAK OUTFLOW IS 255. AT TIME 43.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	255.	207.	121.	49.	5922.
CMS	7.	6.	3.	1.	168.
INCHES		0.43	1.01	1.03	1.03
MM		10.98	25.68	26.20	26.20
AC-FT		103.	240.	245.	245.
THOUS CU M		126.	296.	302.	302.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

		0.	100.	200.	300.	400.	500.	600.	700.	0.	0.	0.	0.	0.
0.30	11													
1.00	21													
1.30	31													
2.00	41													
2.30	51													
3.00	61													
3.30	71													
4.00	81													
4.30	91													
5.00	101													
5.30	111													
6.00	121													
6.30	131													

7.00 141
7.30 151
8.00 161
8.30 171
9.00 181
9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 3301
17.00 3401
17.30 350 I
18.00 360 I
18.30 3701
19.00 3801
19.30 3901
20.00 4001
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 6201
7.30 6301
8.00 640 I
8.30 650 I
9.00 660 I
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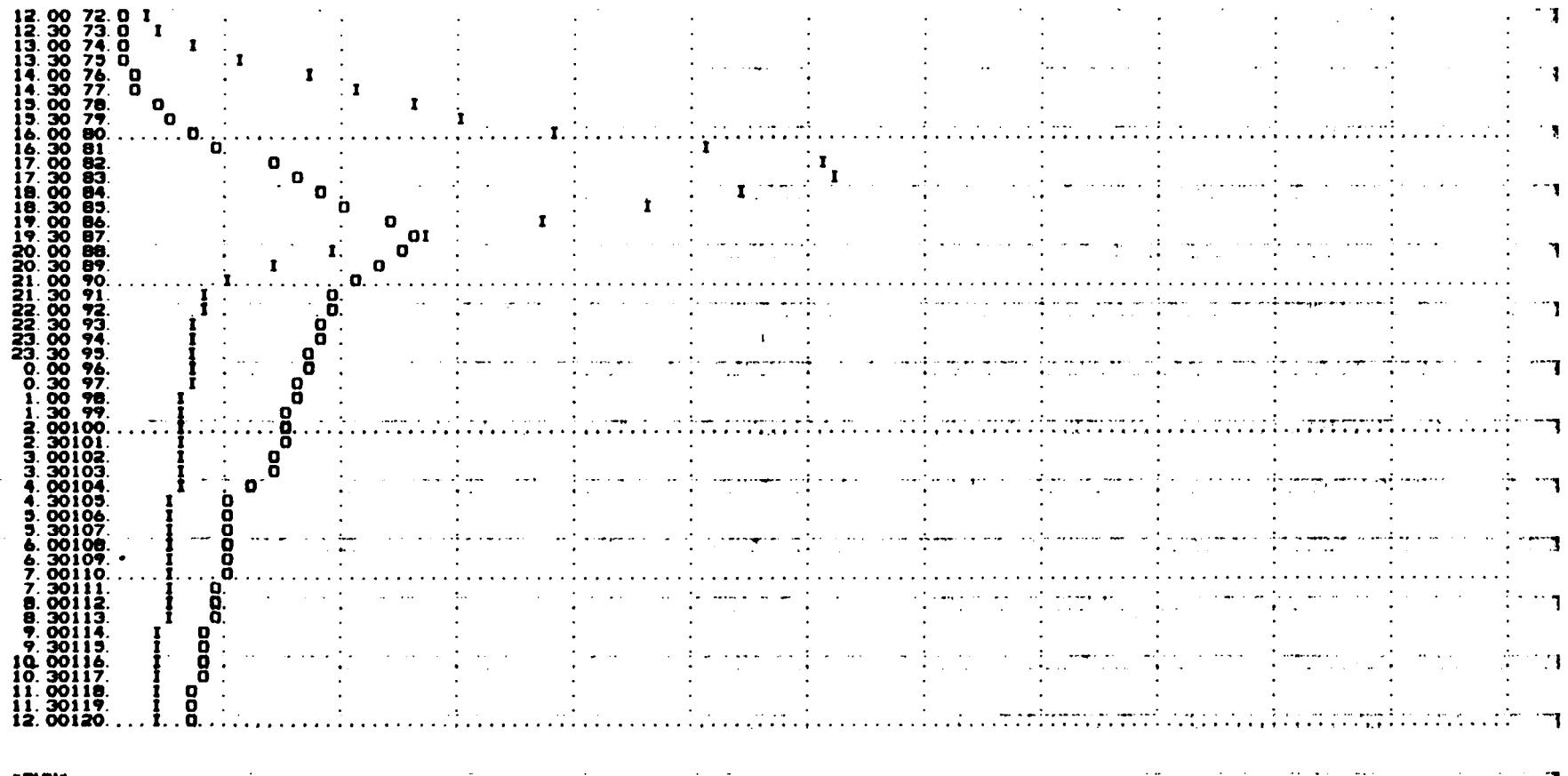
10.00 68.0 I
10.30 69.0 I
11.00 70.0 I
11.30 71.0 I



C-100

OVN

STATION 2, PLAN 1, RATIO 6

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	2.	2.	2.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
3.	3.	3.	4.	4.	5.	6.	7.	7.	8.
9.	9.	10.	11.	14.	18.	28.	40.	54.	75.
99.	148.	173.	195.	256.	300.	312.	297.	270.	239.
213.	194.	187.	182.	178.	173.	169.	165.	160.	156.
151.	147.	142.	138.	129.	104.	102.	101.	99.	98.
97.	94.	91.	88.	86.	83.	81.	78.	76.	74.

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	2.	2.	3.	3.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
3.	3.	3.	3.	3.	4.	4.	4.	4.	4.
4.	4.	4.	5.	6.	6.	7.	8.	9.	10.
11.	12.	14.	16.	19.	25.	32.	41.	52.	64.
81.	101.	121.	140.	153.	160.	161.	159.	155.	150.
144.	140.	139.	131.	126.	122.	118.	114.	110.	107.
103.	100.	96.	93.	90.	87.	85.	84.	82.	80.
78.	76.	74.	72.	71.	69.	68.	66.	65.	64.

STAGE

1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.1	1843.1	1843.1	1843.1
1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1
1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1
1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.2	1843.2	1843.2
1843.2	1843.3	1843.3	1843.3	1843.4	1843.5	1843.6	1843.8	1844.0	1844.3
1844.6	1844.9	1845.3	1845.7	1845.9	1846.0	1846.0	1846.0	1845.9	1845.8
1845.7	1845.6	1845.6	1845.5	1845.4	1845.3	1845.3	1845.2	1845.1	1845.1
1845.0	1844.9	1844.9	1844.8	1844.7	1844.7	1844.7	1844.6	1844.6	1844.6
1844.5	1844.5	1844.4	1844.4	1844.4	1844.4	1844.3	1844.3	1844.3	1844.2

PEAK OUTFLOW IS 312. AT TIME 43.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	312.	235.	132.	54.	6474.
CMS	9.	7.	4.	2.	183.
INCHES		0.49	1.10	1.13	1.13
MM		12.48	28.07	28.69	28.69
AC-FT		117.	262.	268.	268.
THOUS CU M		144.	323.	330.	330.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

0. 100. 200. 300. 400. 500. 600. 700. 0. 0. 0. 0. 0.

0.30 II

C-101

1.00 2I
1.30 3I
2.00 4I
2.30 5I
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3.30 7I
4.00 8I
4.30 9I
5.00 10I
5.30 11I
6.00 12I
6.30 13I
7.00 14I
7.30 15I
8.00 16I
8.30 17I
9.00 18I
9.30 19I
10.00 20I
10.30 21I
11.00 22I
11.30 23I
12.00 24I
12.30 25I
13.00 26I
13.30 27I
14.00 28I
14.30 29I
15.00 30I
15.30 31I
16.00 32I
16.30 330I
17.00 340 I
17.30 350 I
18.00 360 I
18.30 370I
19.00 380I
19.30 390I
20.00 400I
20.30 41I
21.00 42I
21.30 43I
22.00 44I
22.30 45I
23.00 46I
23.30 47I
0.00 48I
0.30 49I
1.00 50I
1.30 51I
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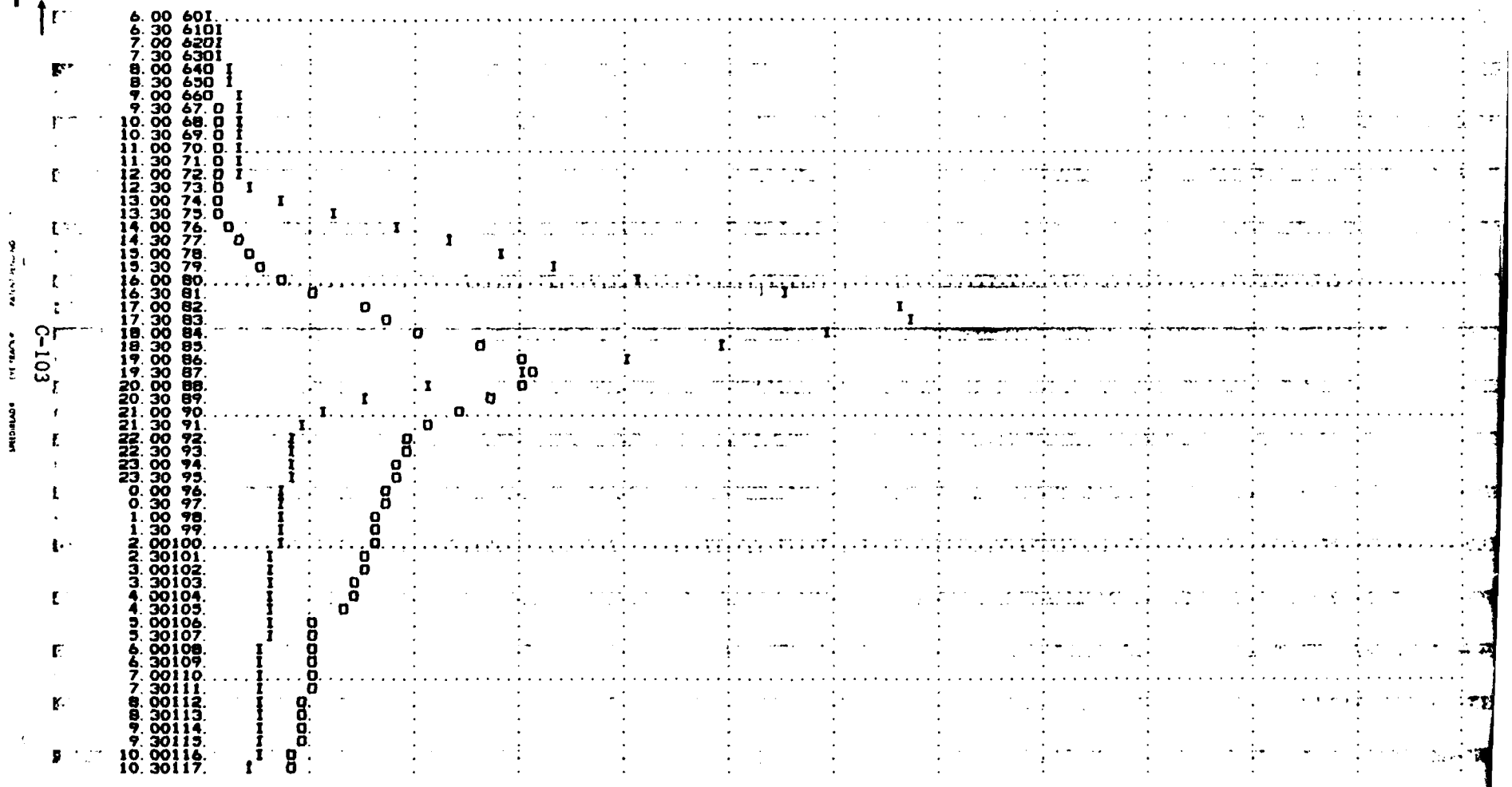
5.30 59I

C-102


C-103
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7.30 6301
8.00 640
8.30 650
9.00 660
9.30 67.0
10.00 68.0
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11.00 70.0
11.30 71.0
12.00 72.0
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20.30 89.
21.00 90.
21.30 91.
22.00 92.
22.30 93.
23.00 94.
23.30 95.
0.00 96.
0.30 97.
1.00 98.
1.30 99.
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8.00112.
8.30113.
9.00114.
9.30115.
10.00116.
10.30117.

```
11.00118.    I    0
11.30119.    I    0
12.00120....I..D.
```

OVN

STATION 2, PLAN 1, RATIO 7

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	2.	3.	3.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
4.	5.	5.	6.	7.	8.	9.	10.	11.	12.
13.	14.	16.	18.	24.	35.	50.	72.	97.	143.
172.	245.	447.	615.	691.	689.	635.	552.	464.	385.
321.	274.	242.	219.	203.	192.	187.	184.	180.	177.
174.	171.	168.	164.	161.	157.	154.	150.	147.	143.
140.	137.	124.	105.	103.	102.	101.	100.	99.	98.

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	1.	1.	2.	3.	4.	5.	6.	6.
6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
5.	5.	5.	5.	5.	6.	6.	6.	6.	6.
6.	6.	7.	8.	9.	10.	12.	13.	15.	16.
18.	19.	21.	24.	29.	38.	49.	63.	78.	97.
121.	151.	179.	197.	204.	204.	199.	190.	181.	171.
163.	156.	150.	146.	142.	139.	135.	132.	129.	126.
123.	120.	117.	114.	111.	108.	105.	102.	100.	97.
94.	92.	89.	88.	86.	85.	84.	82.	81.	80.

STAGE

1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.1	1843.1	1843.1	1843.1	1843.1
1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1	1843.1
1843.1	1843.1	1843.1	1843.1	1843.2	1843.2	1843.2	1843.3	1843.3	1843.3
1843.1	1843.1	1843.1	1843.2	1843.2	1843.2	1843.2	1843.3	1843.3	1843.3
1843.4	1843.4	1843.4	1843.5	1843.6	1843.7	1844.0	1844.2	1844.3	1844.9
1845.3	1845.8	1846.3	1846.7	1846.8	1846.8	1846.7	1846.5	1846.4	1846.2
1846.1	1845.9	1845.8	1845.8	1845.7	1845.6	1845.6	1845.5	1845.5	1845.4
1845.3	1845.3	1845.2	1845.2	1845.1	1845.1	1845.0	1845.0	1844.9	1844.9
1844.8	1844.8	1844.7	1844.7	1844.7	1844.7	1844.6	1844.6	1844.6	1844.5

PEAK OUTFLOW IS 691. AT TIME 42.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	691.	462.	212.	87.	10390.

	CMS	20.	13.	6.	2.	294.
	INCHES		0.97	1.77	1.81	1.81
	MM		24.54	45.06	45.97	45.97
	AC-FT		229.	421.	429.	429.
	THOUS CU M		283.	519.	530.	530.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

0. 200. 400. 600. 800. 1000. 1200. 0. 0. 0. 0. 0. 0.

0.30 11
1.00 21
1.30 31
2.00 41
2.30 51
3.00 61
3.30 71
4.00 81
4.30 91
5.00 101
5.30 111
6.00 121
6.30 131
7.00 141
7.30 151
8.00 161
8.30 171
9.00 181
9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 3301
17.00 3401
17.30 3501
18.00 3601
18.30 3701
19.00 3801
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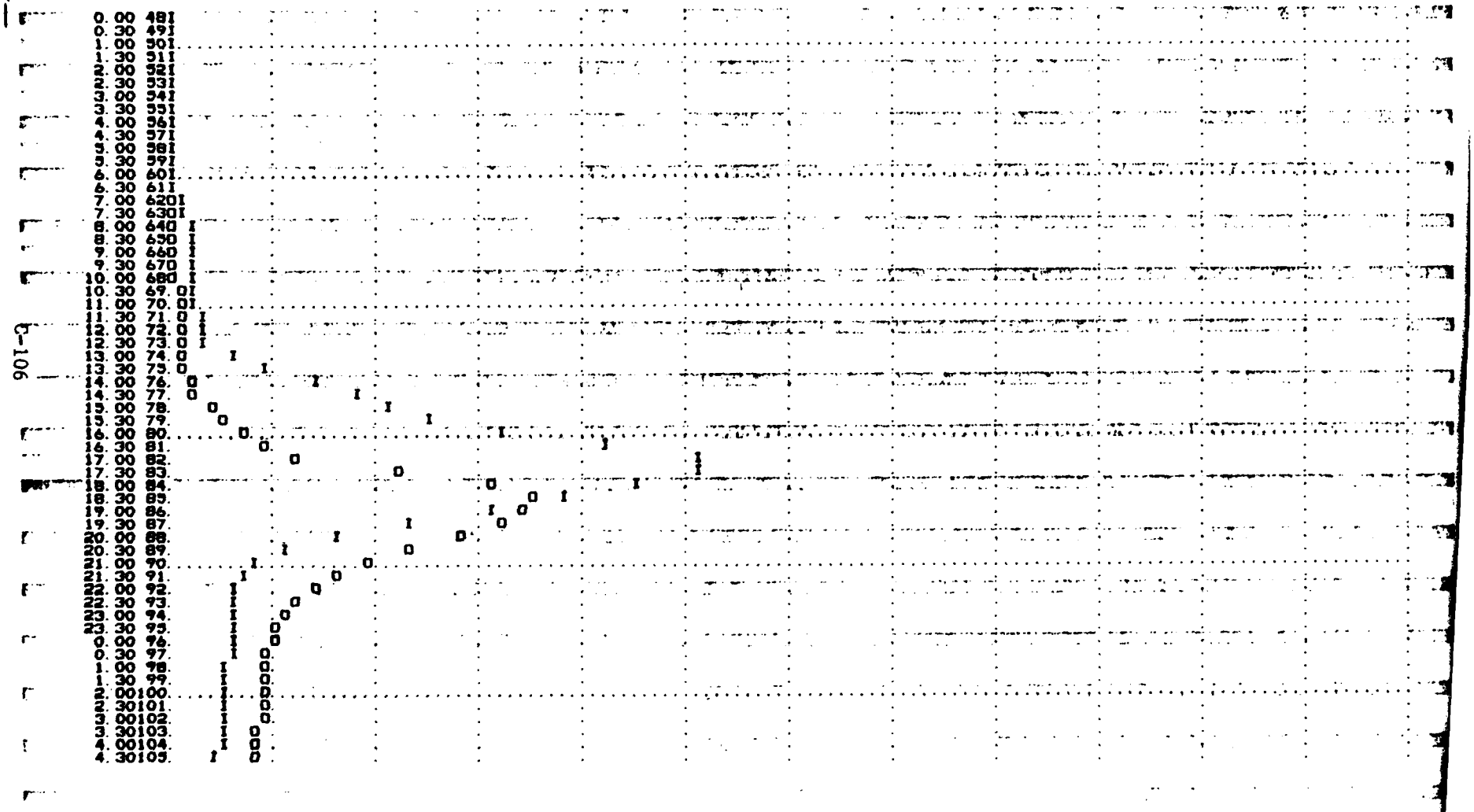
20.00 401
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471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5.30 591
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16.00 80.
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18.00 84.
18.30 85.
19.00 86.
19.30 87.
20.00 88.
20.30 89.
21.00 90.
21.30 91.
22.00 92.
22.30 93.
23.00 94.
23.30 95.
0.00 96.
0.30 97.
1.00 98.
1.30 99.
2.00100.
2.30101.
3.00102.
3.30103.
4.00104.
4.30105.

```
 5.00106.   I    O
 5.30107.   I    O
 6.00108.   I    O
 6.30109.   I   O
 7.00110.   I   O
 7.30111.   I   O
 8.00112.   I   O
 8.30113.   I  O
 9.00114.   IO
 9.30115.   IO
10.00116.  I O
10.30117.  I O
11.00118.  I O
11.30119.  I O
12.00120.  I.O
```

OVN

STATION 2: PLAN 1, RATIO 8

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	3.	5.	7.	8.	10.	10.	11.
11.	11.	11.	11.	11.	11.	11.	11.	11.	11.
10.	10.	10.	10.	10.	11.	11.	11.	11.	11.
11.	12.	13.	14.	16.	19.	24.	29.	34.	39.
43.	48.	53.	64.	84.	127.	167.	233.	479.	799.
1213.	1696.	2090.	2242.	2164.	1948.	1663.	1356.	1072.	839.
662.	541.	463.	411.	374.	347.	327.	311.	298.	286.
277.	269.	261.	254.	248.	243.	237.	232.	228.	223.
219.	215.	211.	207.	203.	200.	197.	194.	192.	189.

STORAGE

0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	2.	4.	6.	9.	11.	13.	14.	15.
15.	15.	15.	15.	15.	15.	15.	14.	14.	14.
14.	14.	14.	14.	14.	14.	14.	15.	15.	15.
15.	16.	17.	19.	22.	26.	29.	33.	37.	40.
44.	47.	51.	58.	70.	90.	116.	149.	182.	214.
249.	285.	313.	323.	318.	303.	283.	260.	238.	218.
202.	189.	181.	175.	170.	166.	164.	161.	159.	158.
156.	155.	154.	153.	151.	150.	149.	149.	148.	147.
146.	145.	144.	143.	142.	141.	140.	139.	138.	137.

STAGE

1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.1	1843.1	1843.2	1843.2	1843.3	1843.3	1843.3
1843.3	1843.3	1843.3	1843.3	1843.3	1843.3	1843.3	1843.3	1843.3	1843.3

1843.3	1843.3	1843.3	1843.3	1843.3	1843.3	1843.3	1843.3	1843.3	1843.3	
1843.3	1843.3	1843.3	1843.4	1843.4	1843.5	1843.6	1843.7	1843.7	1843.8	
1843.9	1843.9	1844.0	1844.1	1844.4	1844.7	1845.2	1845.8	1846.4	1846.9	
1847.5	1848.1	1848.6	1848.7	1848.6	1848.4	1848.1	1847.7	1847.3	1847.0	
1846.7	1846.5	1846.4	1846.3	1846.2	1846.1	1846.1	1846.0	1846.0	1846.0	
1845.9	1845.9	1845.9	1845.9	1845.9	1845.8	1845.8	1845.8	1845.8	1845.8	
1845.8	1845.7	1845.7	1845.7	1845.7	1845.7	1845.7	1845.6	1845.6	1845.6	

PEAK OUTFLOW IS 2242. AT TIME 42.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2242.	1471.	357.	227.	27299.
CMS	63.	42.	16.	6.	773.
INCHES		3.07	4.66	4.76	4.76
MM		78.10	118.29	120.79	120.79
AC-FT		729.	1105.	1128.	1128.
THOUS CU M		900.	1363.	1391.	1391.

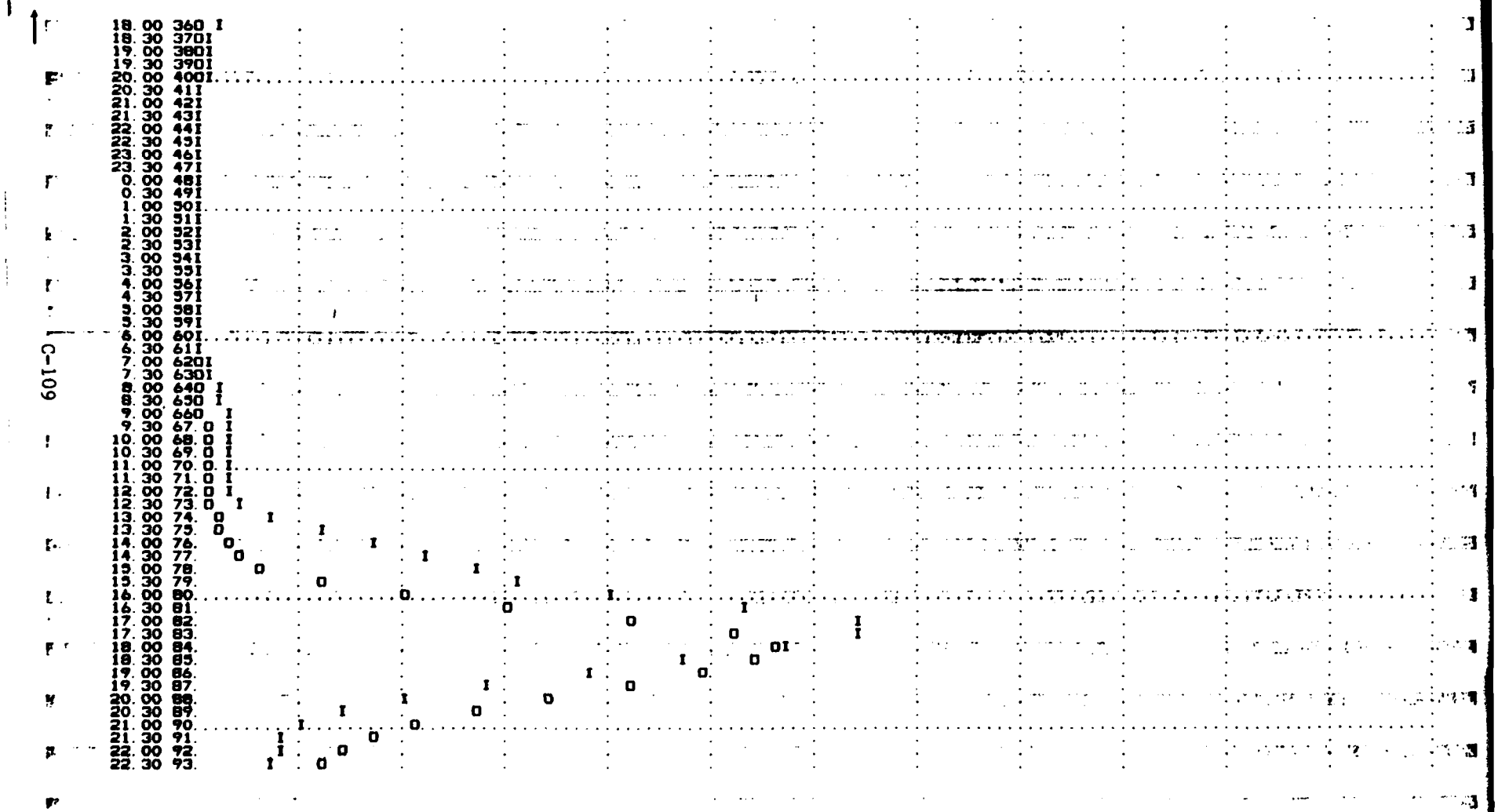
OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

0. 400. 800. 1200. 1600. 2000. 2400. 2800. 0. 0. 0. 0. 0.

0.30	11	
1.00	21	
1.30	31	
2.00	41	
2.30	51	
3.00	61	
3.30	71	
4.00	81	
4.30	91	
5.00	101	
5.30	111	
6.00	121	
6.30	131	
7.00	141	
7.30	151	
8.00	161	
8.30	171	
9.00	181	
9.30	191	
10.00	201	
10.30	211	
11.00	221	
11.30	231	
12.00	241	
12.30	251	
13.00	261	
13.30	271	
14.00	281	
14.30	291	
15.00	301	
15.30	311	
16.00	321	
16.30	3301	
17.00	3401	
17.30	350 I	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20.00 400I
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 6201
7.30 6301
8.00 640 I
8.30 650 I
9.00 660 I
9.30 67.0 I
10.00 68.0 I
10.30 69.0 I
11.00 70.0 I
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12.00 72.0 I
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13.30 75. 0 I
14.00 76. 0 I
14.30 77. 0 I
15.00 78. 0 I
15.30 79. 0 I
16.00 80. 0 I
16.30 81. 0 I
17.00 82. 0 I
17.30 83. 0 I
18.00 84. 0 I
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19.00 86. I 0
19.30 87. I 0
20.00 88. I 0
20.30 89. I 0
21.00 90. I 0
21.30 91 I 0
22.00 92 I 0
22.30 93 I 0

```
23.00 94.      I  O
23.30 95.      I O.
 0.00 96.      I O.
 0.30 97.      IO
 1.00 98.     I O
 1.30 99.     IO
 2.00100.     IO.
 2.30101.     IO
 3.00102.     IO
 3.30103.     IO
 4.00104.     I
 4.30105.     I
 5.00106.    IO
 5.30107.    IO
 6.00108.    IO
 6.30109.    IO
 7.00110.    IO.
 7.30111.    I
 8.00112.    I
 8.30113.    I
 9.00114.    I
 9.30115.    I
10.00116.   IO
10.30117.   IO
11.00118.   IO
11.30119.   IO
12.00120.   IO.
```

C-110

OVN

STATION "2," PLAN 1, RATIO 9

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	2.	3.	6.	9.	13.	17.	20.	23.	23.
25.	25.	25.	25.	24.	24.	23.	23.	22.	22.
21.	21.	21.	21.	22.	22.	22.	23.	23.	24.
24.	26.	29.	35.	42.	50.	61.	73.	84.	93.
100.	116.	141.	156.	182.	357.	754.	1227.	1704.	2226.
2943.	3816.	4498.	4687.	4424.	3916.	3294.	2646.	2060.	1591.
1246.	1022.	889.	804.	745.	704.	672.	647.	626.	607.
591.	576.	562.	548.	536.	524.	513.	502.	492.	482.
472.	463.	454.	445.	437.	429.	421.	413.	406.	399.

STORAGE

0.	0.	0.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
2.	2.	4.	8.	13.	18.	23.	26.	28.	30.
30.	30.	30.	30.	29.	29.	29.	28.	28.	28.
27.	27.	27.	27.	27.	28.	28.	28.	29.	29.
29.	31.	33.	37.	43.	49.	56.	63.	70.	76.

83.	89.	95.	107.	131.	168.	210.	250.	286.	322.	
368.	420.	459.	470.	455.	426.	389.	349.	311.	278.	
252.	234.	222.	215.	209.	206.	202.	200.	198.	196.	
194.	193.	191.	190.	189.	187.	186.	185.	184.	183.	
182.	181.	180.	179.	178.	177.	176.	175.	174.	173.	

STAGE

1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0	1843.0
1843.0	1843.0	1843.1	1843.2	1843.3	1843.4	1843.4	1843.5	1843.6	1843.6
1843.6	1843.6	1843.6	1843.6	1843.6	1843.6	1843.6	1843.6	1843.6	1843.6
1843.5	1843.5	1843.5	1843.5	1843.5	1843.6	1843.6	1843.6	1843.6	1843.6
1843.6	1843.6	1843.7	1843.7	1843.8	1844.0	1844.1	1844.2	1844.4	1844.5
1844.6	1844.7	1844.8	1845.1	1845.5	1846.1	1846.9	1847.6	1848.1	1848.7
1849.4	1850.2	1850.8	1850.9	1850.7	1850.3	1849.7	1849.1	1848.5	1848.0
1847.6	1847.3	1847.1	1847.0	1846.9	1846.8	1846.7	1846.7	1846.7	1846.6
1846.6	1846.6	1846.6	1846.5	1846.5	1846.5	1846.5	1846.4	1846.4	1846.4
1846.4	1846.4	1846.4	1846.3	1846.3	1846.3	1846.3	1846.3	1846.3	1846.2

PEAK OUTFLOW IS 4687. AT TIME 42.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4687.	3135.	1211.	495.	59390.
CMS	133.	89.	34.	14.	1682.
INCHES		6.55	10.12	10.35	10.35
MM		166.47	257.11	262.78	262.78
AC-FT		1555.	2401.	2454.	2454.
THOUS CU M		1918.	2962.	3027.	3027.

OVF

STATION 2

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

0. 1000. 2000. 3000. 4000. 5000. 6000. 0. 0. 0. 0. 0. 0.

0.30	11
1.00	21
1.30	31
2.00	41
2.30	51
3.00	61
3.30	71
4.00	81
4.30	91
5.00	101
5.30	111
6.00	121
6.30	131
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10.30	211
11.00	221
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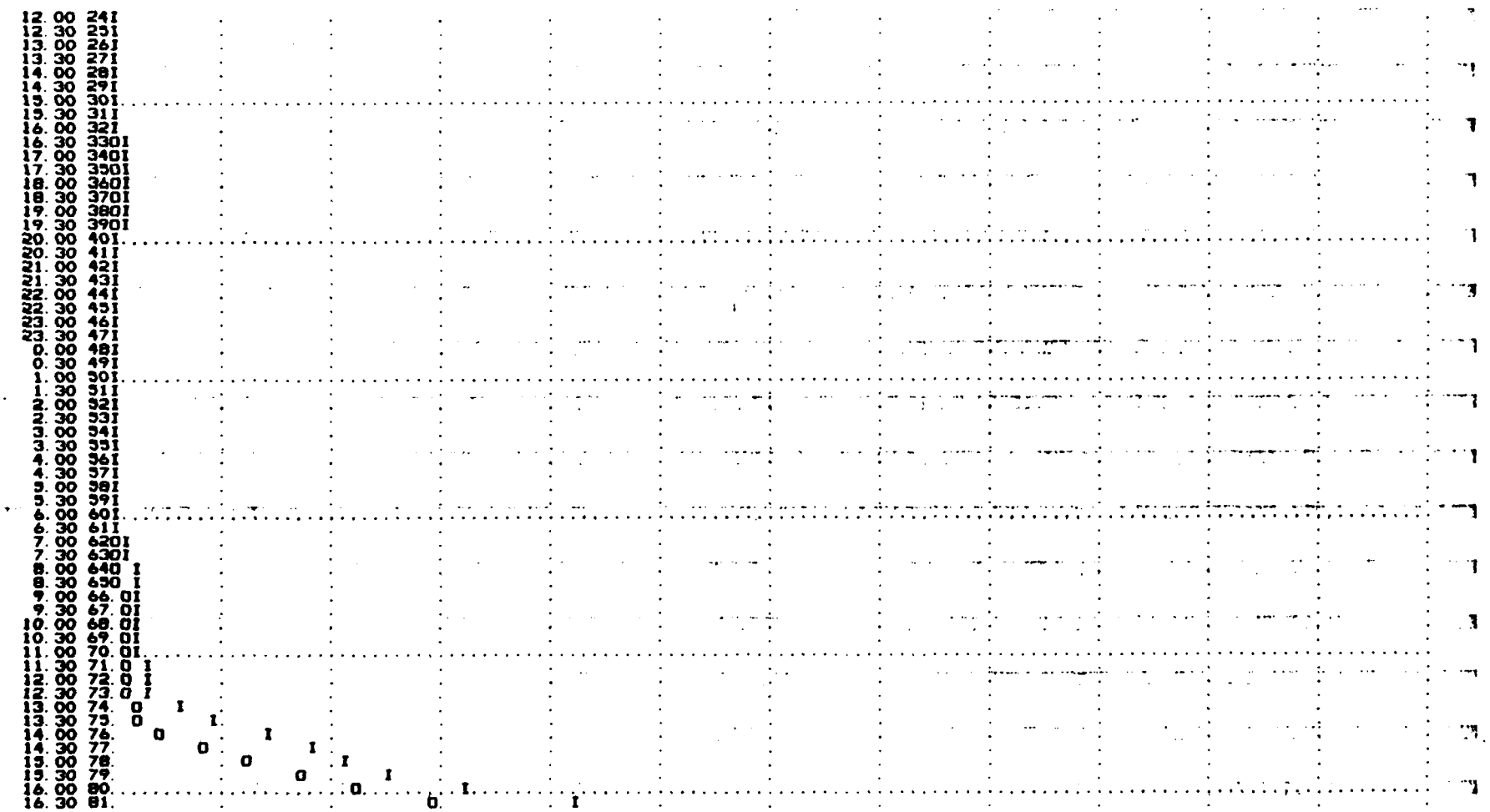
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19.00 380
19.30 390
20.00 400
20.30 410
21.00 420
21.30 430
22.00 440
22.30 450
23.00 460
23.30 470
0.00 480
0.30 490
1.00 500
1.30 510
2.00 520
2.30 530
3.00 540
3.30 550
4.00 560
4.30 570
5.00 580
5.30 590
6.00 600
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7.00 620
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9.30 67.0
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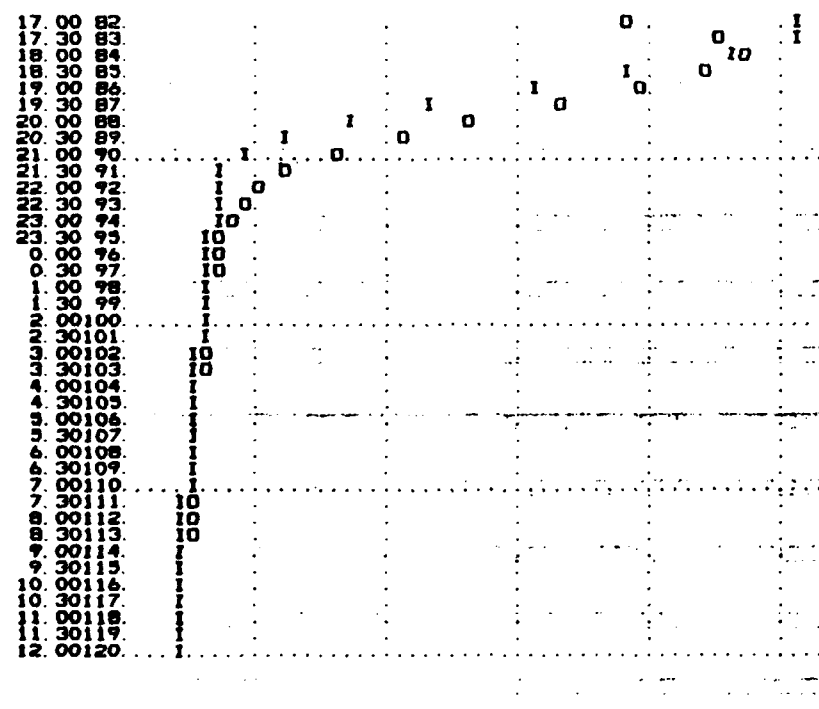

OVN

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PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 0.05	RATIO 2 0.09	RATIO 3 0.10	RATIO 4 0.11	RATIO 5 0.12	RATIO 6 0.13	RATIO 7 0.20	RATIO 8 0.50	RATIO 9 1.00

FLAHERTY GIAVARA ASSOCIATES, P.C.

HYDROGRAPH AT	1	2.57 6.66)	1	328. 9.28)(	590. 16.71)(	656. 18.56)(	721. 20.42)(	787. 22.27)(	852. 24.13)(	1311. 37.12)(	3278. 92.81)(	6555. 185.62)
ROUTED TO	1	2.57 6.66)	1	9. 0.25)(	16. 0.44)(	17. 0.49)(	19. 0.54)(	21. 0.58)(	22. 0.63)(	34. 0.93)(	88. 2.48)(	224. 6.35)
HYDROGRAPH AT	2	1.88 4.87)	1	253. 7.19)(	455. 12.88)(	505. 14.31)(	556. 15.74)(	606. 17.17)(	657. 18.60)(	1011. 28.61)(	2526. 71.54)(	5053. 143.07)
2 COMBINED	2	4.45 11.53)	1	257. 7.28)(	463. 13.10)(	514. 14.56)(	565. 16.01)(	617. 17.47)(	668. 18.92)(	1028. 29.10)(	2566. 72.65)(	5138. 145.49)
ROUTED TO	2	4.45 11.53)	1	83. 2.35)(	168. 4.77)(	182. 5.14)(	207. 5.86)(	255. 7.23)(	312. 8.82)(	691. 19.58)(	2242. 63.50)(	4687. 132.71)

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1956.00	1956.00	1972.80
STORAGE	0.	0.	3449.
OUTFLOW	0.	0.	271.

RATIO OF PMF	MAXIMUM RESERVOIR W.S. ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.05	1956.87	0.00	139.	9.	0.00	60.00	0.00
0.09	1957.36	0.00	252.	16.	0.00	60.00	0.00
0.10	1957.73	0.00	280.	17.	0.00	60.00	0.00
0.11	1957.90	0.00	308.	19.	0.00	60.00	0.00
0.12	1958.06	0.00	337.	21.	0.00	60.00	0.00
0.13	1958.23	0.00	365.	22.	0.00	60.00	0.00
0.20	1959.36	0.00	563.	34.	0.00	60.00	0.00
0.50	1963.84	0.00	1421.	88.	0.00	59.50	0.00
1.00	1969.91	0.00	2748.	224.	0.00		

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1843.00	1843.00	1845.60
STORAGE	0.	0.	137.
OUTFLOW	0.	0.	189.

RATIO OF PMF	MAXIMUM RESERVOIR W.S. ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.05	1844.35	0.00	69.	83.	0.00	44.00	0.00
0.09	1845.25	0.00	118.	168.	0.00	44.00	0.00
0.10	1845.48	0.00	130.	182.	0.00	44.00	0.00
0.11	1845.71	0.11	143.	207.	2.50	44.00	0.00
0.12	1845.88	0.28	153.	255.	3.50	43.50	0.00
0.13	1846.04	0.44	161.	312.	4.50	43.50	0.00
0.20	1846.78	1.18	204.	691.	7.50	42.50	0.00
0.50	1848.72	3.12	323.	2242.	21.50	42.00	0.00
1.00	1850.93	5.33	470.	4687.	22.50	42.00	

FLAHERTY GIAVARA ASSOCIATES, P.C.

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**********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  26 FEB 79
**********************************
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APPENDIX D

PREVIOUS INSPECTION REPORTS/AVAILABLE DOCUMENTS

DAM CONSTRUCTION PERMIT APPLICATION

2-18-22-1000 (6-3749)

STATE OF NEW YORK
DEPARTMENT OF
State Engineer and Surveyor
ALBANY

RECEIVED
OFFICE STATE ENG.
JAN 22 1924
REFERRED

Received Jan 22nd 1924 Dam No. 413 Delaware Watershed

Disposition Approved Feb 2d 1924 Serial No. 548

Site inspected

Foundation inspected

Structure inspected

Application for the Construction or Reconstruction of a Dam

Application is hereby made to the State Engineer, Albany, N. Y., in compliance with the provisions of Chapter LXV of the Consolidated Laws and Chapter 647, Laws of 1911, Section 22 as amended, for the approval of specifications and detailed plans, marked

herewith submitted for the {construction / ~~reconstruction~~} of a dam located as stated below. All provisions of law will be complied with in the erection of the proposed dam.

1. The dam will be on Trout Brook branch of Beaverkill River in the town of Fremont, County of Sullivan and Mouth of stream at Peakville Seven miles due north
(Give exact distance and direction from a well-known bridge, dam, village, main cross-roads or mouth of a stream)

2. The name and address of the owner is A. Holcomb: R. Graham: J. Kutzgar + C. Mann Roscoe

3. The dam will be used for Fishing and recreation

4. Will any part of the dam be built upon or its pond flood any State lands? no

5. The watershed at the proposed dam draining into the pond to be formed thereby is 1/4 square miles.

6. The proposed dam will have a pond area at the spillcrest elevation of 100+ acres and will impound cubic feet of water.

7. The lowest part of the natural shore of the pond is 3 feet vertically above the spillcrest, and everywhere else the shore will be at least 10 feet above the spillcrest.

8. The maximum known flow of the stream at the dam site was cubic feet per second on
(Date)

9. State if any damage to life or to any buildings, roads or other property could be caused by any possible failure of the proposed dam no

10. The natural material of the bed on which the proposed dam will rest is (clay, sand, gravel, boulders, granite, shale, slate, limestone, etc.) Clay on surface with hard pan about 2 ft

11. The material of the right bank, in the direction with the current, is dam; at the spillcrest elevation this material has a top slope of 6 inches vertical to a foot horizontal on the center line of the dam, a vertical thickness at this elevation of 200 feet, and the top surface extends for a vertical height of 6 feet above the spillcrest.

12. The material of the left bank is dame; has a top slope of 3 inches to a foot horizontal, a thickness of 300 feet, and a height of 20 feet.

13. State the character of the bed and the banks in respect to the hardness, perviousness, water bearing, effect of exposure to air and to water, uniformity, etc. Substance is hard and practicaly impervious

14. If the bed is in layers, are the layers horizontal or inclined? ..... If inclined what is the direction of the slope relative to the center line of the dam and the inches vertical to a foot horizontal? .....

15. What is the thickness of the layers? .....

16. Are there any porous seams or fissures? .....

17. WASTES. The spillway of the above proposed dam will be 20 ft feet long in the clear; the waters will be held at the right end by a Concrete Wall the top of which will be 3 feet above the spillcrest, and have a top width of 2 feet; and at the left end by a Concrete wall the top of which will be 3 feet above the spillcrest, and have a top width of 2 feet.

18. There will be also for flood discharge a pipe 24 inches in diameter and the bottom will be 10 feet below the spillcrest, a sluice or gate 20 feet wide in the clear by 2 feet high, and the bottom will be ..... feet below the spillcrest.

19. APRON. Below the proposed dam there will be an apron built of flat rocks and concrete feet long, 18 feet wide and 3 feet thick. The downstream side of the apron will have a thickness of 3 feet for a width of 15 feet.

20. PLANS. Each application for a permit of a dam over 12 feet in height must be accompanied by a location map and complete working drawings of the proposed structure. Each drawing should have a title giving the parts shown, the name of the town and county in which the dam site is located, and the name of the owner and of the engineer.

The location map (U. S. Geological Quadrangle or other map) should show the exact location of the proposed dam; of buildings below the dam which might be damaged by any failure of the dam; of roads adjacent to or crossing the stream below the dam, giving the lowest elevation of the roadway above the stream bed and giving the shape, the height and the width of stream openings; and of any embankments or steep slopes that any flood could pass over. Also indicate the character and use made of the ground.

The complete working drawings should give all the dimensions necessary for the calculations of the stability of the structure, and all the information asked for below under "Sketches." There may be attached to the plans any written reports, calculations, investigations or opinions that may aid in showing the data and method used by the designer.

21. SKETCHES. For small and unimportant structures, if plans have not been made, on the back sheet of this application make a sketch to scale for each different cross-section at the highest point; showing the height and the depth from the surface of the foundation, the bottom width, the top width (for a concrete or masonry spill at 18 inches below the crest), the elevation of the top in reference to the spillcrest, the length of the section, and the material of which the section is to be constructed. Mark each section with a capital letter. Also sketch a plan; show the above sections by their top lines, giving the mark and the length of each; the openings by their horizontal dimensions; and the abutments by their top width and top lengths from the upstream face of the spillcrest and give the elevation of the top in reference to the spillcrest.

22. ELEVATIONS. Also give the elevations, if possible from the Mean Sea Level, of at least two permanent Bench Marks; of the spillcrest for any existing dam on the proposed dam site, at the middle and at both ends of the spill; and of the spillcrest for the above proposed dam.

23. SAMPLES. When so instructed, send samples of the materials to be used in the construction of the proposed dam, using shipping tags which will be furnished. For sand one-half a cubic foot is desired; for cement, three pints; and for the natural bed, twenty cubic inches.

24. INSPECTION. State how inspection is to be provided for during construction. Will consult a licensed engineer before construction, when foundation is in and at completion.

PREVIOUS REPORTS

STATE OF NEW YORK
STATE ENGINEER AND SURVEYOR
ALBANY

DWIGHT B. LA DU
STATE ENGINEER
ARNOLD G. CHAPMAN
DEPUTY

ADDRESS ALL COMMUNICATIONS TO
DWIGHT B. LADU, STATE ENGINEER

Dam 413, Delaware,
Roscoe.

August 27, 1924.

Mr. E. D. Hendricks,
Division Engineer,
Albany, N. Y.

Dear Sir:

Mr. R. D. Graham is building a dam southwest of Roscoe on the outlet of Tennanah Lake, U. S. G. S. Sheet 147, and more than a mile below the lake.

The dam will be 20' wide and composed of an upstream and a downstream wall and stone filled between. The upstream wall is a 6' stone wall with a concrete wall in front 2' thick on top and 3' thick on the bottom and runs 18" into the bed. The downstream wall is 3' thick. The spillway is 20' long by 3' deep and 10' above the ground.

When in the vicinity of this dam will you please make an inspection of this work? The construction work has just commenced.

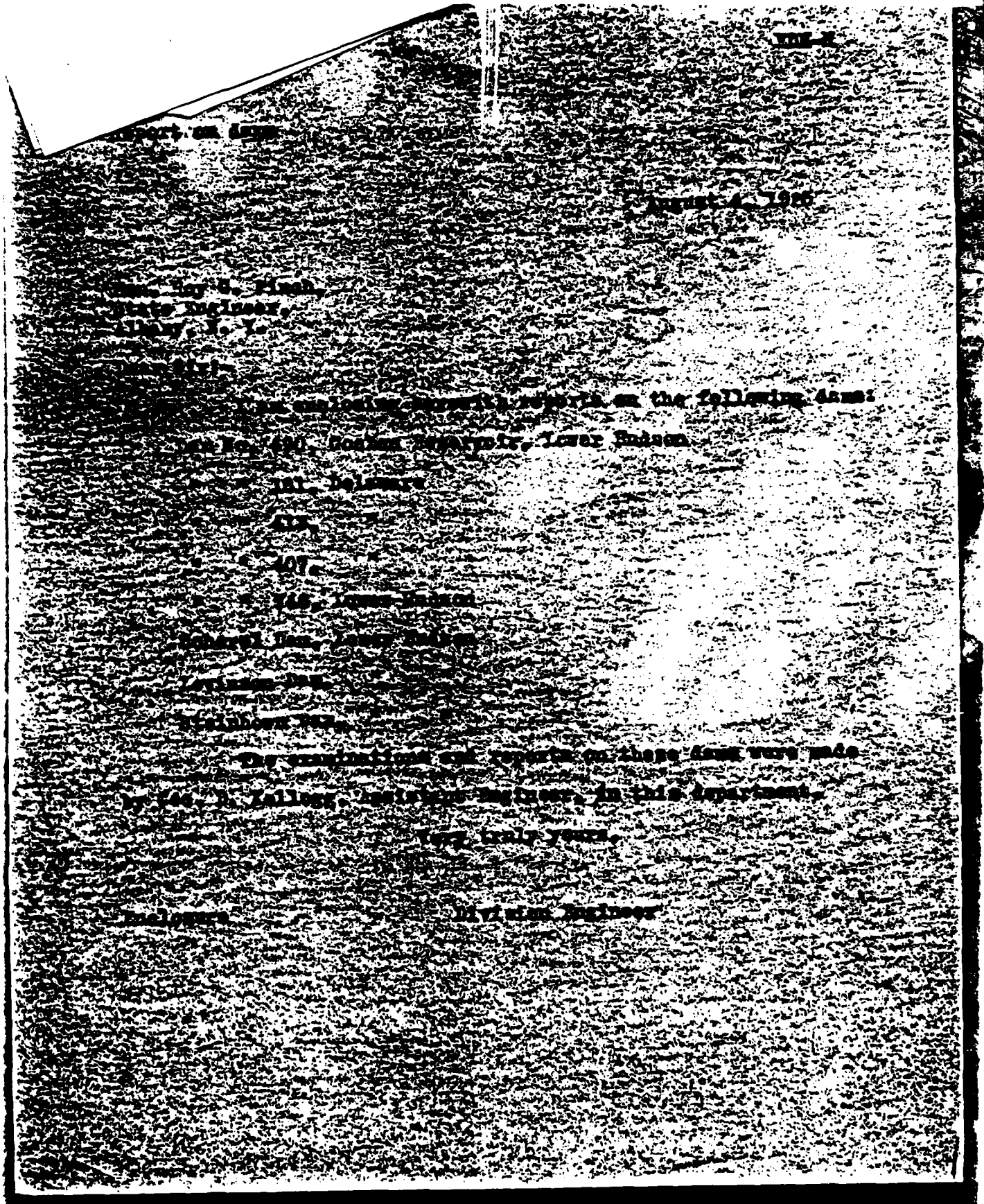
Very truly yours,

Dwight B. LaDu,
State Engineer,

By Arnold G. Chapman
Deputy State Engineer.

ARMcK/F.

PREVIOUS INSPECTION REPORTS



D-6

REPORT ON DAM NO. 413 (Delaware)

Dam No. 413 R.D.Graham
Town of Freemont, Sullivan County.

New dam. Completed.
Construction Approved.

Topog. Sheet #147
Livingston Manor Quad.

July 28, 1925.

I inspected dam #413 on July 9, 1925. Mr. Graham was not at home but I talked with a young man who was staying at Mr. Graham's during the construction of the dam. The concrete wall on the upstream face has a top width of one foot and the top of the wall was about eleven feet above the bed of the stream. The young man told me that the bottom width was about three feet, that the bottom rested upon hardpan and was from three to six feet below the original ground surface. The wall was carried well into the banks to act as cut-offs and was about 150 feet long. The down stream wall was dry masonry and it was stone fill between the walls. The top width of the dam was about seventeen feet. The spillway section and apron were about as shown by sketches on application. The apron extended for about six feet below the dam. It was rip-rap covered over with cement mortar. Instead of the two foot drain pipe, they placed a hemlock box about 18" square with a plank gate at the upstream end. It would be well to learn if this box is encased in concrete. I could see no seepage whatsoever thru or around the dam. The down stream dry wall looked none too good and may, in time, have to be relayed.

The drainage area is about 4¼ sq. mi. and the pond floods about 100 acres. Lake Tennanah on the same stream and about one mile up stream floods over 200 acres.

George D. Kellogg
Asst Engr.

PREVIOUS REPORTS

Lake Muskoday
ROscoe, N. Y. 12776
Sept. 15, 1975

Mr. George A. Danskin, Local Permit Agent
Dept. Environmental Conservation
21 S. Putt Corners Rd.
New Paltz, N. Y.

Dear Mr. Danskin:

The Lake Muskoday Bungalow Colony Inc. wants to do some reinforcing work below our dam which is located on the headwaters of Trout Brook, Town of Fremont, Sullivan Co., about 2 miles below Tennannah Lake, and is listed as Dam 413 Delaware Watershed.

I called your office while you were on vacation and spoke to Mr. William E. Stridle explaining that we wanted to bring in rock fill to place below the dam for extra reinforcement and to make a rip-rap and stone masonry extension out from the existing spillway so the overflow will be a gradual flow instead of the existing drop structure.

Mr. Stridle told me there was a possibility that we would not need a permit for doing this type of work and advised me to get in touch with Mr. Douglas Meagley of the Soil Conservation Service.

I called Mr. Meagley, who in turn called Mr. Stridle and the Albany office. His information from Albany was that there are 3 categories to consider where a permit is necessary:

1. Raising the level of the lake
2. Increasing spillway overflow
3. Working on main part of dam

none of which we are planing.

Since he would not be able to inspect and give us advice in time to do any work this fall , he suggested we hire a private engineer to make sketches of the proposed work and mail them to you.

We have started lowering the lake and would like to do some of the rock fill this fall if possible, and then complete the work next fall.

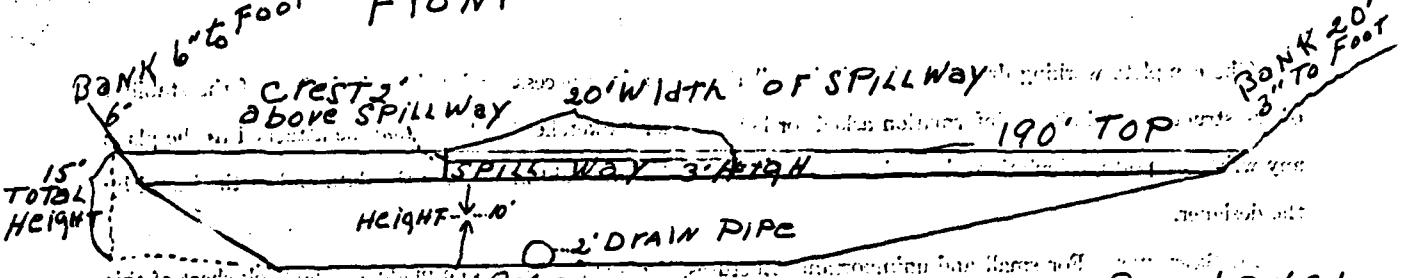
Please advise us if we can do this work or if we need a permit.

Sincerely yours,

Lake Muskoday Bungalow Colony Inc.

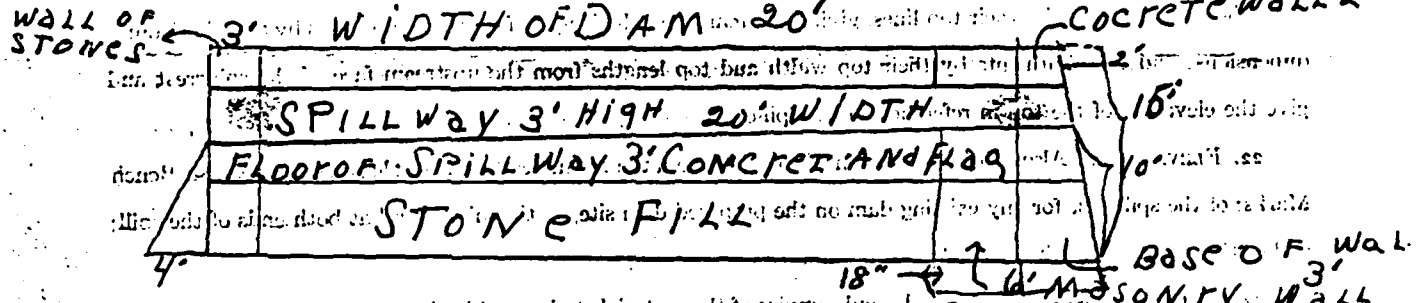
Dorothy B. Graham, Sec.

FRONT OF DAM

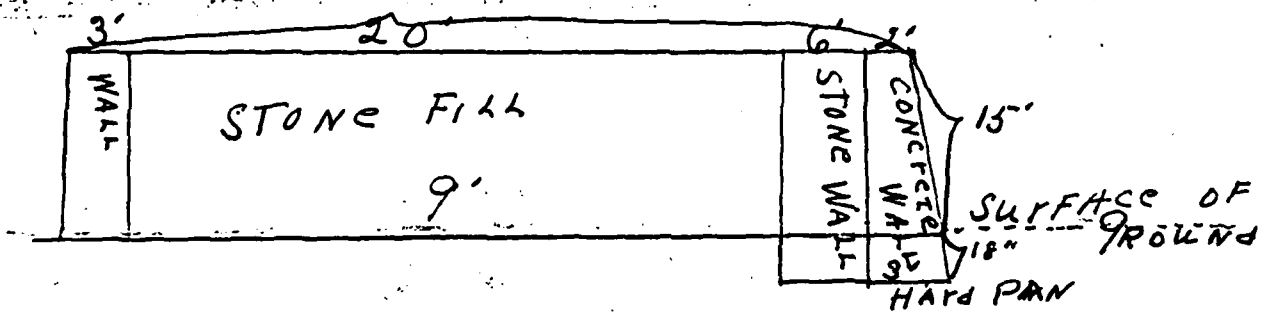


ELEVATION 2200 Ft. Above Sea Level

CROSS SECTION OF DAM AT SPILLWAY



CROSS SECTION OF DAM



The above information is correct to the best of my knowledge and belief.

R.D. Graham
(Address of signer)

Jan 21 1924
(Date)

I have been given power to sign for other owners.
(A person signing for Applicant should indicate his title or authority).

Lake Muskoday
ROscoe, N. Y. 12776
Sept. 15, 1975

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Dept. Environmental Conservation
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New Paltz, N. Y.

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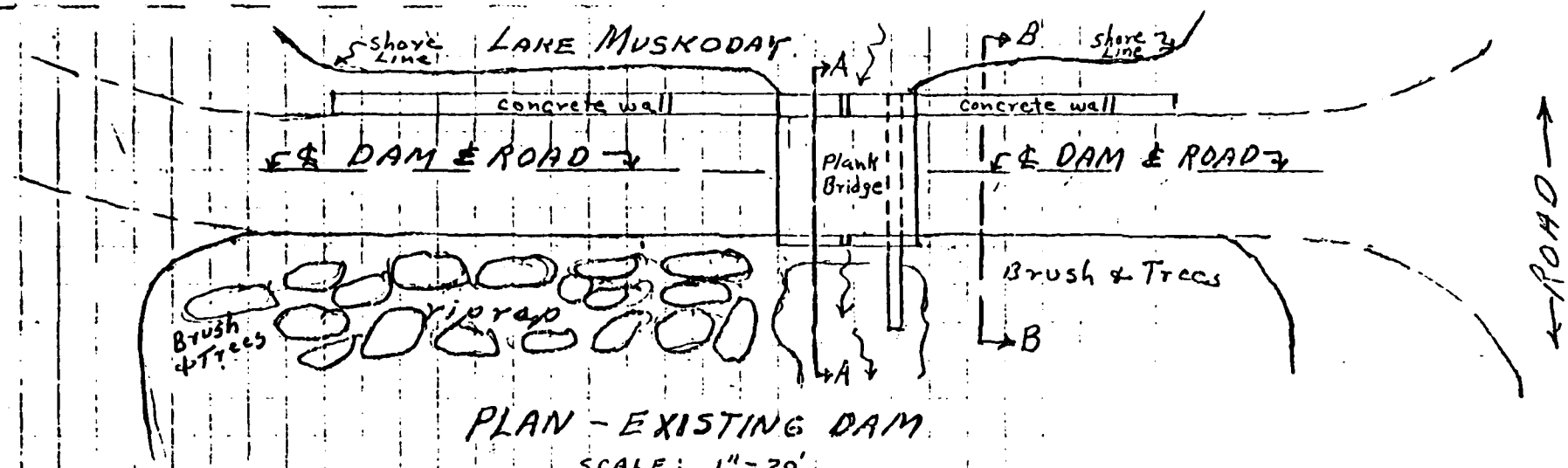
Sincerely yours,

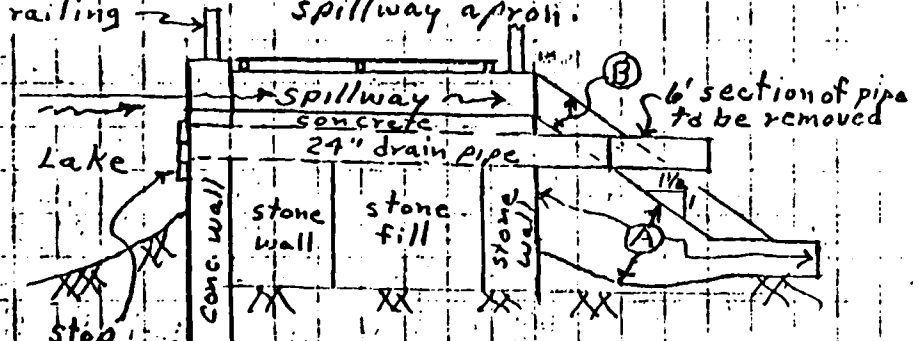
Lake Muskoday Bungalow Colony Inc.

Dorothy B. Graham, Sec.



PLAN - EXISTING DAM

SCALE: 1" = 20'



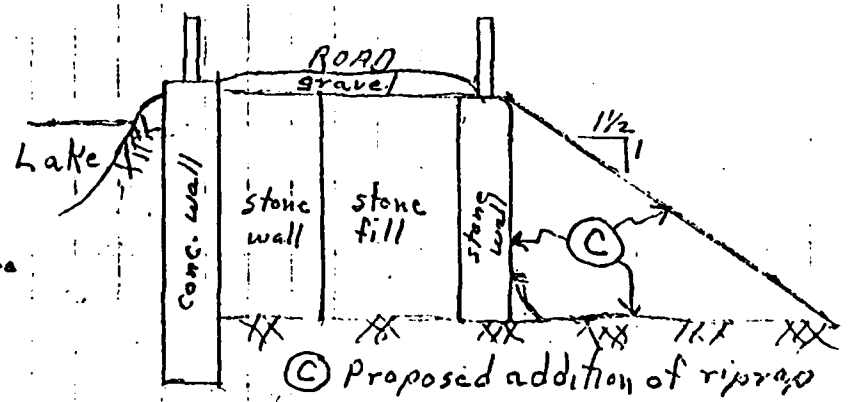
Ⓑ Proposed addition of stone masonry sidewalls for spillway apron.

6' section of pipe to be removed

Ⓐ Proposed addition of riprap with 1½' thick stone masonry for surface of spillway apron

SECTION A-A

SCALE: 1" = 10'



Ⓒ Proposed addition of riprap

SECTION B-B

SCALE: 1" = 10'

NOTE: Riprap will be about ⅓ Cu. Yd. in size

PROPOSED ADDITION OF RIPRAP AND STONE MASONRY TO THE LAKE MUSKODAY DAM

Prepared by Sheldon Haddan
P.E. # 033312
Date: September 9 1925

PREVIOUS INSPECTION REPORTS

DEC DAM INSPECTION REPORT Lake Muskoday

RB	CTY	YR. AP.	DAM NO.	INS. DATE	USE	TYPE
00	53	24	413	062073	002	2

AS BUILT INSPECTION

- [3] Location of Spillway and outlet
- [3] Size of Spillway and outlet
- Reconstructed Since Construction
- [3] Elevations
- [3] Geometry of Non-overflow section

[1] GENERAL CONDITION OF NON-OVERFLOW SECTION

[1] Settlement	[1] Cracks	[1] Deflections
[1] Joints	[2] Surface of Concrete	[1] Leakage
[1] Undermining	[1] Settlement of Embankment	[1] Crest of Dam
[1] Downstream Slope	[1] Upstream Slope	[1] Toe of Slope

[1] GENERAL CONDITION OF SPILLWAY AND OUTLET WORKS

[C] Auxiliary Spillway	[1] Service or Concrete Spillway	[1] Stilling Basin
[1] Joints	[2] Surface of Concrete	[1] Spillway Toe
[2] Mechanical Equipment	[1] Plunge Pool	[1] Drain

[1] Maintenance	[B] Hazard Class
[3] Evaluation	[3] Inspector

COMMENTS:

Concrete spillway with 2' drain pipe cmp. under access road good cond.

APPENDIX E

STRUCTURAL STABILITY ANALYSIS

(No STRUCTURAL STABILITY ANALYSIS was required for this dam)

APPENDIX F

REFERENCES

REFERENCES

1. Chow, Ven Te, Editor - Handbook of Applied Hydrology. McGraw-Hill Book Company, New York, New York, 1964.

2. Hydrologic Engineering Center, U.S. Army Corps of Engineers, HEC-1 Flood Hydrograph Package, Users Manual. Davis, California, January 1973.

3. Hydrologic Engineering Center, U.S. Army Corps of Engineers, Flood Hydrograph Package (HEC-1), Users Manual for Dam Safety Investigations, Davis, California, September 1978.

4. King, Horace and Brater, Ernest. Handbook of Hydraulics, 5th Edition. McGraw-Hill Book Company, New York, New York, 1963.

5. Riedel, J.T., Appleby, J.F. and Schloemer, R.W. Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1000 Square Miles and Durations of 6, 12, 24, and 48 Hours (Hydrometeorological Report No. 33) U.S. Department of Commerce - Weather Bureau and U.S. Department of the Army - Corps of Engineers, Washington, D.C., April 1956

6. U.S. Department of the Interior, Bureau of Reclamation, Design of Small Dams, Second Edition, Washington, D.C., 1973.

APPENDIX G

DRAWINGS

(No DRAWINGS were available for this dam)